SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

COAL-CUTTING MACHINERY.

SIR,—In my last letter I expressed the opinion that the question of the relative merits of the saw and the pick had been exhausted, and I am confirmed in that opinion after further consideration. There is a strife of words remaining, but the object you had in view when you invited me to give my opinion on the subject will not be promoted by that contention; and so after this letter it is not my intention to waste my time upon it. But I must ask you to allow me to make a few remarks in explanation of some of the allegations made by Mr. Bass, which cannot be passed over.

Mr. Bass has not felt restrained from using passages from my letters in a sense exactly opposite to that which I employed them, nor do I see how—and I make the complaint advisedly—he could have unintentionally done it. He asserts that I "admit," when I dissent, that I have employed inaccurate data when it is perfectly correct, that when it will "suit my purpose" the best I make use of a formula which, when he turns it against me I blame him; whereas I do not blame him at all, rather I applaud him for what he has done, for certainly he has turned nothing against me save his own erroneous inferences, and which are easily set right. When he falls into a mistake he says it is "too bad" in my exhibiting it, that I admit that the principle of his machine is the best, when I am under the strongest conviction that it is the reverse, and he maintains with the utmost pertinacity that 1½d. in cost of power is greater than 7d.

Astonished by some of Mr. Bass's statements of the quantity of work that his machines were said to be doing, I asked for the names of the collieries where the averages were drawn from, but he takes no notice of the application; and so far as he is concerned the door is shut to investigation. Because I say but little in praise of our own machine, he reproaches me for saying too little, and because I have said something not in praise of his machine, he blames me for saying too much. When I give reasons for not praising his work he insists upon it that I abuse him, and instead of presenting argument to argument he entertains you with a dull anecdote about the "barrister," which all your readers will have been long ago acquainted with. This he does apparently to divert your attention from the real question. He does not yet quite understand whether it will "suit his purpose best" to condemn the "Monitor," or to speak well of it, because of its being a rotary; but no doubt Mr. Alexander will be propitiated by gently leaving the question of 50 tons or 300 tons a-day to be settled by that gentleman by a touching stroke of magnanimity in what he calls "justice to an absent opponent," where no proof of injury has been offered.

For these and some other reasons I have come to the conclusion that, in order to bring the matter to a fair issue, I now propose that we shall send to the New Market Colliery one of our machines, and there work it in competition. That each of us shall deposit in your hands 100*l.*, to await the decision of an umpire, whom you shall name, and that the money of the owner of the machine that shall be adjudged to have done its work the best shall be returned to him, and the other shall be paid to one of the public charities in the West Riding, which shall be named by the owner of the best machine, that there shall be no favour to either machine, and that all things shall be as nearly equal as is possible to have them, allowing in the judgment for "loose" or "fast" ends, as the case may be, and other special work incidental to one or the other of the two machines. The colliery is one which Mr. Bass's machine has been working at for some time. The strata are not of the character which he says the pick is adapted for; he says that his machine possesses "enormous superiority" over ours; and, therefore, I am entering into an unequal contest, but it will be better for all parties that the issue shall be now taken, so that neither may be longer kept in a state of doubt about the place he holds in the matter of the relative merits.

May 12. WILLIAM FIRTH.

COAL-CUTTING MACHINERY.

SIR,—Your leading article in the Journal of May 1, and Mr. Firth's letter in last week's Journal, are both mainly devoted to criticism on one of our machines which is now working at Adwalton, near Leeds. In both of these articles statements are made so contrary to all I had previously heard about the working of that machine that, in order to ascertain the truth, my son has been over to the colliery, and learned that your representative, on the occasion of his visit to Adwalton Colliery, there met the manager and engineer of Mr. Firth's colliery, which is quite sufficient to account for many of the extraordinary assumptions and difficulties he narrates. The two articles above referred to evidently have reference to the same visit, and it is remarkable how statements in many cases so differing from provable facts could be made; but as you thought well to send your representative to Mr. Firth to see his machine near Tingley, and ours at Adwalton, without making me acquainted with your intentions, I must ask you to give a prominent place to the following statement.

The machine does *not* require 45 lbs. of air to work it, as supposed by your representative, but at the time of his visit was working with 24 lbs., as indicated by a guage placed within 20 yards of the machine.

Your representative did not see the machine working in coal, as he did Mr. Firth's, and, therefore, was not justified in drawing the conclusion he did (which is entirely contrary to the facts)—"That the rotary is calculated to do more damage to the material cut than the pick." It is of great importance to the coalowner that the *dirt* should be cut in, and not the *coal*, when this is practicable, as by so doing *all* the coal is saved. At Adwalton the men refused to "hole" in the dirt. The proprietors tried one machine before ours, and found it would not work successfully; they applied to Mr. Firth, but he would not guarantee to do it; they then arranged to test our machine, with what result I will presently show.

Mr. Firth's statement as to the machine stopping in consequence of its getting to the end of the rope is not the fact, as his men marked off 6 yards, and when it had cut that they left, and the machine went on and finished the benk.

At Adwalton there are two benks, each 35 yards long, they are about 100 yards apart. *Three* men are *all* that are employed about the machine any part of the day. The 35 yards are cut, as per your showing, in about 1 hour and 40 minutes; the three men, *not six* as stated by Mr. Firth, then move it to the other benk, this occupying not more than 10 minutes, *not four hours* as stated by Mr. Firth. The removing and re-fixing of the cutter-wheel, oiling, fixing the rope, fitting on air-pipe again, and making all things ready for a fresh start occupies from 10 to 15 minutes, and then the other benk of 35 yards is cut as before in 1 hour and 40 minutes, thus cutting the 70 yards, including the removal of the machine, in 3¾ hours, *not eight hours* as stated by Mr. Firth. These men have then done with the machine, and are set to other work.

The statement then stands thus, and I again follow Mr. Firth's mode of putting it:—

3 men with the machine 3¾ hours each, at 5s. 3d. per day	7s. 6d.
2 men laying roads	None.
2 men end cutting	None.
6 men removing machine	None.
Total	7s. 6d.

Quantity of coal undercut in the above case, reckoning as Mr. Firth does a 4-ft. seam, giving 30 cwt. per yard, is 105 tons, at a "cost for mere cutting wages upon the coal got" is ·85 of a penny per ton, *not* ·10½ of a penny as stated by Mr. Firth. The cost of air for the above, calculated again on Mr. Firth's estimate of 6d. per 1000 ft. at 40 lbs. pressure, stands thus:—The machine, as shown in my former letter, uses when at work 5428·8 cubic feet of air per hour, it worked as above 3 hours 20 minutes, using 18,093 ft. of air to produce 105 tons of coal, or 173 ft. per ton, costing for air, at 4d. per 1000 ft., 9-12ths of a penny nearly. Then,—

The cutting wages are	0·85 of a penny.
The cost of power	0·70 ,,
Total	1·55 of a penny.

Or 1½d., instead of 17½d. as stated by Mr. Firth. To carry on the comparison, had Mr. Firth's machine been able to work in the Adwalton "dirt," which I very much doubt, it would have taken him, by his own showing, 10 hours working to undercut the above quantity of 105 tons, and to have cut this weight at Adwalton would have necessitated the removal of his machine twice. It, therefore, stands thus:—

2 men attending his machine while cutting, 10 hours each at 10d.	£0	16	8
2 men road laying, 4 hours each at 9d.	0	6	0
2 men moving the machine twice, 4 hours each at 8d.	0	10	8
2 men end cutting	None.		
Total	£1	13	4

This is 3 11-12ths of a penny per ton "for mere cutting wages upon the coal cut." Then,—

The cutting wages	3 11-12ths of a penny.
Cost of air	1 1-12 ,,
Total	5 pence.

Leaving 3½d. per ton in favour of the Rotary machine.

I have been obliged to charge Mr. Firth's machine with the cost of road laying, as it requires special rails and sleepers, whereas ours works on the ordinary pit rails as laid for the colliery tubs to run on. The above calculations are made from data taken at the colliery, and could easily have been ascertained by Mr. Firth's representatives. It is, therefore, much to be regretted that they were not faithfully represented to him, in which case I cannot believe he would have made the statements and estimates he has done. In all I have written about the Gillott and Copley machine I have endeavoured to base my statements on facts. I have no doubt Mr. Firth is surprised that any rotary machine can do the work this does, but this is no reason why its powers should be represented as they were in your last issue. If this correspondence is to lead to any good results it must be carried on in good faith, and in a friendly spirit, and nothing shall be wanting on my part to render it so. I feel I have a thoroughly good case, and nothing to fear from publicity.

Had you informed me of your wish to see the Gillott and Copley machine at work I could have taken your representative to a colliery where he would have seen it both in "dirt" and coal. The Adwalton machine does its work very well, but it is by no means a favourable place to judge of its powers, as it is only a newly-opened pit, and there is no room at present to work it to its full advantage.

I have not seen Mr. Firth's machine, and, therefore, cannot judge of its simplicity, but I have never found any ordinary colliery mechanic who could not easily attend to all the requirements of our machine. ISAAC GRAY BASS.

18, *Bow street, Sheffield, May* 12.

P.S.—In the conclusion of my last letter you have a typographical error; it should read—"*I have* not as yet met with any seam of coal that has proved too hard for the machine to cut," not "*he has*," &c.

COAL-CUTTING MACHINERY.

SIR,—I have read with great interest the controversy on the comparative merits of the rotary and percussive systems of mechanical coal-cutting which has been carried on between Mr. Firth and Mr. Bass in the last few numbers of the *Mining Journal*. Having had the opportunity of practically testing almost every successful machine which has hitherto been introduced, with the exception of that of Messrs. Winstanley and Barker, you will, perhaps, permit me to offer a few remarks upon the subject. I must say that the way in which the matter was left last week was anything but satisfactory, and I think the impression left upon the minds of most of your readers, who were not practically acquainted with the working of coal-cutting machines, must have been decidedly in favour of Mr. Firth. Mr. Bass's letter was weak and equivocal, and he contented himself with again expressing his opinion that the Gillott and Copley Rotary Machine is the best of that class in England or America, and that the rotary system possesses "enormous advantages" over the pick machine. All this may be true, but it is no proof. Mr. Firth, on the other hand, is most candid in his way of stating the case, and much that he says could not be gainsayed either by Mr. Bass or by anyone who has had any experience in mechanical coal-cutting. But, on the other hand, I think he very much overstimates the difficulties attending the use of the Gillott and Copley machine. As an engineer, it certainly does seem to me a more reasonable method of dealing with the coal which is embodied in the Gillott and Copley machine, than that in Mr. Firth's, just as I should never think of making a slotting machine to work like a steam hammer; but I put far more value on Mr. Firth's opinion than I do on my own in this particular instance, since he tells us that he has spent both much time and money in endeavouring to make a successful rotary machine, and that he has failed. I think a discussion on such a subject as this must be fruitless unless we get at some statistics. I will, therefore, give you the result of my own experience in working Gillott and Copley's machine, and I trust that Mr. Firth will do the same for his own, so that the basis of a comparison may be arrived at. But, in the first instance, I must entirely dissent from Mr. Firth's estimate of the cost of labour in working the machine, which he gives at the bottom of the first column of his letter. He assumes:—

3 men constantly attending machine at 5s. 3d. per day	15s.	9d.
2 men road laying	6	0
2 men end cutting	9	3
6 men removing machine	16	0
Total	47s.	0d.

The figures were no doubt correct at some colliery from which Mr. Firth has drawn his information, but I must tell him that such an amount of labour is altogether superfluous. I entrust a machine to two men, who cut the coal by contract at so much per yard of face, minimum depth of cut 3 feet. Now, these two men lay their own road while the machine is at work, taking it up behind, and passing forwards and laying in front, three pair of rails only being used. They remove the machine from one place to another *without any additional wage*, and lastly, the men in the benk make the wheel hole for nothing. I will now append a table showing the actual working of *one* machine from the beginning of this year, the same being worked by two men per shift only:—

Week ending.	Yards of face undercut.	No. of shifts of 8 hrs. for 2 men.	Yards undercut per hour.	Remarks.
January 6	152	3	6·33	
13	159	3	6·63	
20	240	4	7·50	
27	154	3	6·42	
February 3	55	—	—	Accident to machine.
10	270	4	8·44	
17	495	10	6·19	
24	174	4	5·44	
March 3	138	3	5·75	
10	510	10	6·36	
17	439	10	5·49	
24	274	5	6·85	
31	30	—	—	Easter.
April 7	621	11	7·06	
14	162	3	6·75	
21	329	8	5·14	
28	450	9	6·25	
May 5	352	8	5·50	
Average	313	6	6·32	

The machine from which I have taken the foregoing data is cutting in a seam about 3 ft. in thickness and of an exceedingly hard woody nature. Mr. Firth may, perhaps, have doubts whether it is as hard as the seam at West Ardsley, but no mining engineer would attempt to discuss a question which would be influenced by the mode of working adopted, by the thickness of cover, the nature of the roof and thill, and a thousand other things which vary in the same pit. As Baird's machine has been mentioned by Mr. Bass, I must say that I believe it is capable of doing an amount of work not differing materially from that done by Gillott and Copley's. A series of experiments during the months of January and February gave an average of about 13·68 yards per hour when actually working, or about 5, including removal. You will observe that I follow Mr. Firth in his estimate of speed. The Gillott and Copley machine has cut in the seam I refer to at the rate of 28 yards per hour, but the average working result is only 15·72, and including removal only 6·32.

In conclusion, I cannot say that the Gillott and Copley is a more awkward machine to handle in a pit than Mr. Firth's. I think this must be evident if two men find no difficulty in dealing with it in a 3-ft. seam. With regard to the question of the cost of power, I have never very carefully gone into the cost, as the air-compressing machinery is chiefly used for supplying air to hauling-engines and pumps. I believe, however, that the deduction made from the tonnage of the hewers where the coal is cut by machine nearly covers the cost of labour at the machine and the power, and that we are slightly gainers by the improved sample of coal, the seam producing one-fourth more round coal than formerly. If Mr. Firth will send you such data as may enable a comparison to be formed of the relative merits of the two machines he will confer a boon on the mining community. A MINING ENGINEER.

COAL-CUTTING MACHINERY.

SIR,—We see you have an article in the Journal of May 1, on Coal-Cutting Machinery, in which you contrast Gillott and Copley's Patent Rotary Machine and Firth's Pick Machine, and as you give an opinion of the merits of the two machines, perhaps you will allow me to make a few remarks, and correct what we consider some slight errors in reference to the former machine, which we have at work at the New Market Colliery, Adwalton, near Leeds.

In the first place you say that the pressure of air was 45 lbs. per square inch at the compressor. This was no doubt true each time your correspondent went into the engine-house to inspect the engine; but the coal-cutting machine was standing at the time, consequently that could no be taken as the standard pressure at which the machine works. The pressure at which we work the machine is from 50 lbs. to 55 lbs. per square inch, but at the time that the machine cut 6 yards in 17 minutes the pressure was only 24 lbs. per square inch; this we ascertained by looking at a pressure gauge which we have fixed within 20 or 30 yards of the machine. Then, another thing, we had two of the cutters out of the wheel at the time.

Secondly, you further say that the men in charge of the machine expressed an opinion that it would require no repairs until regularly worn out. Allow us to say that no man or men in charge of the machine said anything of the kind. The question asked was, "How often the machine had been broken down?" when the manager, Mr. Parker, replied that it had not cost a shilling in repairs all the time it had been at work. The only person who ventured to give an opinion as to the time the machine would last, and the repairs it would require, was an engineer not connected with the New Market Colliery.

Thirdly, you further say that it has not been tested in cutting coal, it has been used for cutting in the "muck" beneath the coal. Now this is not strictly true: we do not cut at the foot of the bed but in the centre. Perhaps the following section of the seam will explain.

You will see that we have two or three partings of dirt; we have marked them respectively 1, 2, 3, 4, 5, not drawn to a scale. We do not cut under the coal marked 5, but in the dirt marked 4. Then another thing, when we get the coal by hand the piece of coal marked 3 is all got into slack, which for purposes of sale are useless. Now, by cutting in the dirt marked 4 we preserve the piece of good coal marked 3, which is worth three times as much as any other part of the bed. To tell the truth, any machine which will not cut in the dirt is not worth a shilling at the New Market Colliery, and this was the only reason why we introduced the rotary machine, because we knew it would do this.

You speak of the practical difficulties of the Rotary Machine, such as "fast benks must have a place to go in at, and another to come out at, tedious and costly preparations of the road for carrying the machine," and much delay upon the slightest disarrangement. Now, this we cannot understand. As to first difficulty—"fast benks," if your correspondent had asked we might have told him that we do not happen to have any fast benks. Our pit is laid out for working the coal by machinery on the "long wall back stroke," hence all our coal is divided into 30-yard blocks, the straight work being driven at right angles to one another. Suppose we have a face 210 yards long, we have 7 roads into it, and these we use as hurrying roads; hence we take the machine in at one end and take it out at the other; and as to this being a costly thing we do not look upon it as such, as two men can take the machine from one working place to another as soon as they can take either a corf of dirt or a corf of coal. Then, as to costly preparations of the roads, &c., we have only solid headed sections of T-headed rails, about 25 lbs. per yard, with the common larch sleeper notched for the rails to lay in, this is all we have, and, in fact, all we require.

May 6. JOHN PARKER, Manager.
JOHN TAIT, Underviewer.

THE CHANNEL BRIDGE.

SIR,—I think most of your subscribers will think with me that we have reason to be much indebted to you for the article in the Journal of May 1 on this subject. I have always thought that M. Boutet's system of bridge building was likely to succeed, and have waited with confidence to see the result of the careful experiments which the French preliminary company were engaged in, some of which I have myself witnessed, and I am rejoiced to find that they have surmounted the difficulties thrown upon them by the war, and the disorganisation that was occasioned to the trade and commercial enterprise of the country, and appear to be in a fair way to carry out this project to practical results. I shall, in common with many others I could name, watch with extreme interest the further progress of this interesting and important project, and shall be much obliged by any further information you may be enabled to afford.

Union-court, Old Broad street, May 13. SUBSCRIBER.

ON MINING IN TASMANIA.

SIR,—Since my last communication on the progress of mining in Australia I find, by the Journal, that a paper from the pen of Mr. Wellington has been read at the Royal Polytechnic Institution, at Falmouth, by Mr. Bolitho, on the subject of tin deposits there. Having known Mr. Wellington for many years as a practical miner and ore dresser, I was surprised to find that he considers the deposit of tin ore at Mount Bischoff (Tasmania) to be a volcanic production. With all due respect to Mr. Wellington, I beg to differ with him. The greater part of the tin ore (alluvial) is, I think, derived from the decomposition of the granitic rocks, not only at Mount Bischoff but at George's Bay and other parts of the island, as well as in New South Wales and in Queensland. Although fine crystals of tin ore can be seen in the parent rock, independent of any vein or lode, it does not follow that none of the ore in the drift is derived from the backs of lodes not yet identified. There is a tin lode on the Waratah Company's property which, since I first called attention to it, has been found rich in ore. The lode is said to be at the present depth (30 ft. from the surface) about 3 ft. 6 in. wide, with well-defined walls in the slate formation. I am of opinion that the slate rock in this locality will be found to contain ores of commercial importance besides tin.

With regard to the tin deposits at Mount Bischoff, it is a matter of little importance to parties interested how the tin got there. All practical men who have examined the place know that the deposit is a very rich one, but to say it is the richest in the world, or that it is inexhaustible, is, to say the least of it, strong language; and I think such an assertion would not come from a man of European experience in tin mines. In mining matters none of us are infallible; however great the practical experience there is something to learn, particularly in a new country. Up to the present about 500 tons of ore have been dressed at Mount Bischoff, not quite enough to glut the markets. I must not omit to say the company have had many difficulties to contend with, amongst which is a very bad road to the works, and until a tramway is constructed the rich deposit of tin at Mount Bischoff will not find its way in money value into the shareholders' pockets. The smelting furnaces at Launceston are in full work, turning out about 20 tons of very good quality tin per week. The furnaces are well constructed, and the whole affair reflects great credit on the manager, Mr. Jenkin, and on Mr. Hancock, the builder.

The ironworks on the banks of the Tamar are also in a fair way of becoming a great commercial success. I have previously reported on the richness of the iron ore deposits: competent and experienced men have now taken the matter in hand. It is due to Mr. Swift to say he smelted the first iron, but I presume it will soon be due to

Mr. Scott to say that he made the first malleable iron on the banks of the Tamar. That Tasmania will ultimately grow rich from its mineral wealth I have no doubt. JOHN HUNT,

Late Manager of the Cornish and French Mines of Peurose and Pontpean.

Geelong, March 21.

IRON AND COAL DEPOSITS AT WALLERAWANG.

SIR,—The subjoined abstract of an exhaustive paper upon this subject, read before the Royal Society of New South Wales by Prof. A. Liversidge, of the Sydney University, and Associate of the Royal School of Mines, London, will, no doubt, be of interest to the readers of the *Mining Journal;* I shall, therefore, feel obliged if you will insert it the first opportunity, and give facility for the publication of any comments upon it which any other correspondents may be disposed to make.—*Pitt-street, Sydney.* J. W. W.

Prof. LIVERSIDGE remarked that many are probably aware that there are large deposits of iron ore and extensive beds of coal in the neighbourhood of Wallerawang, but comparatively few, perhaps, are in possession of any very definite information concerning them. He regretted that it was only in his power to speak definitely upon the actual deposits of iron ore, coal, and closely associated limestone; but as Mr. Charles Wilkinson, the geological surveyor recently appointed by the Government, is now engaged making a survey of the district, a complete report upon the whole of the coal measures and iron deposits of the area will, no doubt, soon be forthcoming. Wallerawang is about 105 miles from Sydney, on the western line of railway, the township and station of that name being situated on a drift composed of pebbles, disseminated through a soft argillaceous cement or clay: the enclosed pebbles consist principally of rolled fragments of quartz, jasper, flinty slate, argillaceous sandstone, and other substances. On the whole, this drift bears a very close resemblance to the diamond-bearing drift of Bingera and other places, and, like the diamond drift, this contains nodules of conglomerate compound of rounded and sub-angular fragments of white and coloured quartz, and various other minerals agglutinated together into a compact mass by a ferruginous cement. It also contains a small quantity of gold, but apparently not in sufficient quantities to pay for working at the present time. Good sections of the drift are seen at the Wallerawang Railway Station and along the Mudgee and other roads near the town, where several small cuttings show its structure very well. The deposits of iron ore at present opened out are situated some six miles from Wallerawang, and near the junction of the coal measures with the upper Silurian or Devonian beds, which there crop out to the surface; these deposits contain two varieties of iron ore—magnetite or magnetic oxide of iron, and brown hematite or goethite, the hydrated oxide; then, in addition to these, there are deposits of hematites worth 50 per cent. of metallic iron.

The vein of magnetic iron ore runs apparently N.E. by S.W. This can only be stated approximately, for, owing to the action exercised by it on the needle, the compass was found to be perfectly useless in the vicinity of the lode. The ore is scattered over the ground in blocks and nodules along its outcrop, but at a little depth it is in a solid and compact body, merely broken across here and there into large masses by joints and fissures. In one part the vein has a width of 13 ft.; but at another spot, where a trench was cut across, it was there found to be not less than 24 ft. in width. Two shafts have been sunk on this vein, one to a depth of 10 and the other to a depth of 23 ft.; at these depths the quality of the ore is about the same as that at the surface. Certain portions of the vein are evidently richer than others, hence there is no reason why the vein should not prove to be richer in depth also. At present the average yield of metallic iron from the vein, as a whole, is not rich for a magnetite, which when perfectly pure contains 72·41 per cent. of iron, and under ordinary circumstances about 70 per cent., whereas the Wallerawang vein yields only 40·89 (see analysis appended) per cent.; although this is a poor magnetite it must not be regarded as a poor ore of iron.

The garnet occurs both crystallised—in the form of the rhombic dodecahedron—and in the massive state; the crystals are, as is usually the case, very uniform in size; they are nearly all of them either about ¼ or ¼ in. in diameter. The faces of the crystals are smooth, free from pits and irregularities, and bounded by sharp and well-defined edges. The colour is brown, without any red shade. Portions of the massive garnet and aggregations of crystals are hard and compact, whilst in other parts they are more or less disintegrated and friable. The average percentage of metallic iron is 21·05—an amount not much less than that contained by many ores commonly smelted.

The general direction of the outcrops of brown hematite is not so decided as that of the lode, and it will, probably, be found that other veins run into it, but for a large portion of its course it runs approximately N.E. by S.W. Although the back of the lode does not absolutely come to the surface along its entire course, yet there is a great probability of all the different outcrops being connected beneath the surface, in which case the total length of the deposit, so far as it has been at present traced, cannot be much less than a mile. Along this line of outcrop the ore is seen scattered all over the surface in great blocks and nodules, either completely exposed or but partially embedded, and over a width of from 12 to 18 ft. in one part to as much as even 50 or 60 ft. in another. The thickness of the deposit below the surface has not yet been fully ascertained, but a shaft has been put down in the lode itself to a depth of 43 ft., and at the bottom a level was driven, which proved it to be of the same quality through a thickness of 18 or 20 ft.; there are no decided appearances of the boundaries of the deposit having been cut, except on the north-east side, so that it may eventually prove to exceed the thickness mentioned.

The coal measures in this district contain several very valuable and thick beds of coal, the three principal ones being the lowest, or No. 1, which is 17 ft. 6 in. thick; the No. 2, or next above, 6 ft. 6 in.; and the No. 3, 4 ft. 6 in. There are other seams, but as they are thinner they are of minor importance, and are not likely to be touched for some years. The outcrop of No. 1 seam is seen in the banks of Coal Creek, on the western dividing range. A trial shaft sunk through it has proved it to be 17 ft. 6 in. in thickness, divided by a parting of fire-clay some 8 in. thick. The parting of fire-clay shows the numerous remains and impression of coal measures plants principally, their thin rootlets in this case embedded in the original soil in which they grew. At this period of the history of the coal bed there must have been a change in the conditions throughout the area over which this parting extends, the circumstances were clearly not suitable for the continuance of the growth of luxuriant vegetation which previously covered it; this unfavourable change may have been brought about by a variety of causes, it was most probably due to a gradual depression of the area beneath the surface of the water, which depression extended sufficiently long to allow of the deposition and accumulation of the 8 in. of fire-clay, which was originally in the form of finely divided mud or silt. It is generally regarded that coal has been derived from the decay of terrestrial plants which flourished in marshy places, and that the majority of them consisted neither of true land nor of true aquatic plants, but such as go to form the peat mosses, mango, and other swamps of the present day; hence a considerable depression of the area would be inimical to such growths. After this process of depression had gone on for a certain time then the area was again slowly upheaved, and the remaining 8 or 9 ft. of coal was accumulated. The quality of the coal is very good; it is hard and compact, and would, therefore, be well adapted for certain metallurgical processes, especially for use in the blast-furnace, where it would have to sustain great weight, and under circumstances where ordinary tender bituminous coal would have to be previously coked. Coal from No. 1 seam gave upon analysis—volatile hydrocarbons, 33·24; fixed carbon, 55·74; white ash, 9·50; moisture, 1·51; it is very free from sulphur.

The outcrop of No. 2 bed is seen in Coal Gully, and an exploratory level has been driven into it a distance of about 60 ft. At the outcrop, where cut by the level, it is seen to be about 6 ft. 10 in. in thickness, with a 2-in. parting of fire-clay, which, however, is gradually pinched out as the level proceeds inwards, and finally on the face disappears altogether. The roof is a hard and compact sandstone. Throughout their entire thickness the coal measures consist of alternate beds of fire-clay or shale, the original soil on which the coal vegetation grew, coal, and sandstone succeeded by shale, and coal again, and so on. Occasionally the order may be slightly altered; but in the main the series is continued throughout in that way. In quality the coal is almost identical with the former one, but, as is shown by analysis, it contains rather more combustible matter and less ash. Like the former, it is very free from sulphur, and has a specific gravity of 1·398, whilst that of No. 1 is 1·333. The No. 3 seam has a thickness of 4 ft. 9 in., with a 3-in. parting, leaving 4 ft. 6 in. of coal. It is rather a brighter and more tender coal than the others, and will probably be found well adapted for household purposes. It occurs at a height of about 76 ft. above the seam No. 2, or 6 ft. 6 in. bed; while that, in turn, is about 118 ft. above the seam No. 1, or 17 ft. 6 in. bed. Clay-band No. 1 is situated some 12 ft. above this No. 3 seam, or 4 ft. 6 in. bed, and the other two clay bands a little higher. One of the seams of coal crops out on the Mudgee-road about 2½ miles distant, but as I did not take the levels, this requires confirmation. This seam is worked apparently on no large scale, by levels driven in from the road side.

Between the iron deposits and the coal seam outcrops there is seen an outcrop of limestone abutting against Devonian or Upper Silurian slates—both the slates and the limestone are here standing at a high angle—the limestone does not show the dip so distinctly as the slates, for the lines of bedding have been almost completely obliterated, but the dip appears to be about 75° to the eastward, and the strike nearly N. and S. At the junction of the two the limestone has evidently undergone much disturbance, and is much brecciated, and includes within it fragments of the slate. The slate contains small crystals of iron pyrites disseminated through it. In colour the limestone is of a bluish grey or slate colour, much veined with white colcite. The slate-coloured portions break with a slight crystalline appearance, but the colcite veins show the rhombohedral cleavage of that mineral on a large scale. The extension can be traced for a long distance north.

In conclusion, Mr. Liversidge observes that this portion of the district of Wallerawang seems to be destined to be one of the greatest and most flourishing portions of the colony. Here, within a comparatively small circle of some four miles diameter, there are extensive and rich deposits of iron ores, coal, and abundance of limestone. At present nothing has been done with them, but as a company has recently taken up large selections of the lands for the purpose of erecting ironworks there is a prospect that in a short time an attempt may be made to utilise some of this great wealth. The whole of the district along the western line near to and beyond Hartley is one of exceeding interest and importance to the geologist from a purely scientific point of view, quite apart from the actual intrinsic value of the various mineral deposits which it contains; and, moreover, it must be a source of great gratification to all who take any interest in these matters to know that at least the resources of this and other portions of New South Wales stand a fair chance of being thoroughly and properly examined, now that the first step towards having a geological survey of the country has been taken by the Government, a step which may be regarded as an earnest of something to follow on a more comprehensive and extended basis, for, of course, it is utterly impossible for any one geologist, however great his attainments, to make single-handed a finished survey of a country like this.

No one will deny that money spent upon such an object is not spent in one of the best possible ways, whether it be purely for the extension of scientific knowledge, or merely for the exploration or development of the mineral wealth of the colony. And, perhaps, the truest wisdom is to keep both ends in view. The extension of science would make but comparatively little progress without the aid of wealth, and wealth at the present day cannot be attained without calling in the aid of science; they are mutually dependent, and on that account we cannot afford to neglect either of them. The exploration and development of the mineral wealth of a county should always be kept a long way in advance of the work of realising and converting such stores into money. When we consider the great repositories of iron ores which have been already discovered in New South Wales, and that we are likely to hear of others, perhaps equally extensive, there appears to be no reason why New South Wales, with proper care and management, should not very soon make not only all the iron required for its own consumption, but also supply other countries, which are not so lavishly endowed with such iron and coal deposits.

COPPER MINING IN SOUTH AUSTRALIA.

SIR,—Some months ago I wrote you on "Copper Mining in South Australia," and now, as the Government is at last alive to the necessity of opening up the rich mineral district in the Far North by means of railway communication with Port Augusta, a few lines concerning the district may be acceptable.

The best and almost the only route to the Far North from Adelaide is by train to Burra, a distance of 100 miles, and from thence by Terry's mail coaches to Blinman, or the Sliding Rock; these places being respectively 350 and 380 miles from Adelaide. The vehicles called coaches resemble the old English coaches, inasmuch that when new they are painted red, and there the resemblance ceases. They are built in American fashion, with high wheels; the body is closed in front and behind, and has no door, the passengers getting in through the so-called windows, which are situated at the sides. In cold weather a canvass covering is drawn across these windows. The largest sized coaches are licensed to carry 9 passengers inside and 3 out, including the driver and guard; but I have left the Burra with 23 persons on the coach, and the misery of such a trip over a rough country cannot be described.

The track lies through the centre of the Flinders Range, and would under other circumstances be a very pleasant one. Nearly all the flats and valleys for the first 70 miles are being cultivated for wheat. This year the farmers have made a bold push inland, and thousands upon thousands of acres that had never before been ploughed are being fallowed for another season. The Pekina and Black Rock plain looks like the bed of an ancient lake, and for 40 miles the track crosses it, where, with the exception of a creek or or two, it is as level as a bowling green. This ground is now being rapidly taken up by farmers.

The Flinders Range is evidently originally of volcanic formation, with subsequent upheavals through earthquakes, consequently the hills assume the most fantastic shapes and forms. Several quartz reefs are to be seen from the track, most of which contain gold, although not in paying quantities. I saw one rich specimen, but could not discover the reef from whence it was broken. Black and red hematite iron lies scattered about the ground in all directions, and every little gutter shows micaceous iron, shining in the sun, but commercially it is of no value. I have seen lead, cobalt, and bismuth in the Far North, but the ores of copper are the most plentiful. No true lode has yet been worked in the district, although probably half-a-million pounds worth of copper has been sent away, which has been raised from irregular scattered branches and deposits, that rarely extend to any depth, and are evidently upheavals from the main lodes. These lodes, with splendid quartz and gossan backs, are found at intervals, but do not contain ore in payable quantities at surface, and consequently are not touched.

For hundreds of miles in length traces and stains of ore are to be seen; in some places the rocks being so green that to an inexperienced eye they seem all copper, and this has given rise to the reports in some newspapers of "mountains of solid ore." Here and there are deposits that vary in weight from 1 cwt. to thousands of tons of ore, and sometimes do not extend 3 ft. in depth, whilst at the Blinman it shows no signs of dying out, although 360 ft. beneath the surface. In most cases the copper ore is of high percentage, but is sometimes mixed up with a good deal of iron. The assays vary from 10 to 50 per cent., and some parcels of the native copper at the Sliding Rock have reached as high as 80 per cent. Several small claims are being privately worked, but the great bulk of the copper hitherto raised has come from the Blinman, Nuccaleena, Yudanamutana, and Sliding Rock Mines.

The ore at the Blinman Mine is found in a lenticular mass of calcareous sandstone, running north and south, that seems to have forced its way up through the surrounding country, as the bluish shaly slate by which it is bounded on the east dips east, whilst that on the western side dips west. The sandstone is about 30 ft. wide, and is interspersed throughout with specks, patches, and small strings of copper ore, consisting chiefly of chrysocolla, malachite, chalcosite, and a little red oxide. At irregular intervals floors and veins of solid ore, varying from 6 in. to 3 ft. in width, run obliquely across the mass, and it is principally from these that the ore has been hitherto raised. At about 250 ft. in depth water was struck, and underneath this point the rock changes to a white silicious limestone, the ore being high-quality copper pyrites. The engine-shaft is 360 ft. deep, and the levels extend some 450 ft. in length.

Blinman Mine was worked for some years by an English company, who erected a large plant, including five furnaces for smelting; but although they raised copper to the value of a quarter of a million sterling, yet by extravagance and mismanagement they could not make it pay. The mine is now let on a royalty to two English gentlemen, who are personally superintending the operations, and I am informed are working it profitably, but in order to make large profits it will be necessary to lay out some thousands of pounds upon the property, and this will not be done until negociations on foot for the sale of the mine by the mortgagees are completed. This mine will, in my opinion, continue in the years to come to be one of the most valuable and lasting mines in the Far North.

In my next I purpose giving you an account of the native copper deposit at Sliding Rock.—*Adelaide, March* 20. CHILLEY.

OBSERVATIONS ON THE FREIBERG ORE DISTRICT.

SIR,—The celebrated department of Freiberg, in Saxony, which is resorted to by students from every part of the globe, is one of the most remarkable mineral districts in the whole world, both in the extent and variety of its lodes and ores, and also from the unusual facilities which the renowned academy presents for studying their formation, mode of extraction, and subsequent treatment. It may not be out of place to mention here that admission is granted to anyone, no matter of what nation, who can speak a very little German, and pay the necessary fees. These latter amount to about 5*l.* yearly for each course, besides an entrance fee of 5*l.* The course is completed in about two and a half or three years; it is rather theoretical, but still it depends a good deal on the inclination of the student whether it can be made practical or otherwise. Certainly the opportunity is there if he chooses to grasp it. I may mention that 10*l.* a month allows a very fair margin for all expenses, fees included, as Freiberg is a very cheap place to live in. The district consists essentially of gneiss, overlaid by mica-schist and clay-slate, which are intersected by porphyry dykes. There are two distinct varieties of gneiss—red and grey, of which the latter contains nearly all the lodes. The ores comprised in the lodes are zinc, arsenic, copper, lead, and silver, and over 900 have been discovered. They are seldom more than 2 ft. wide, and have been divided into four distinct classes, according to their matrix.—1. The noble quartz formation.—2. The pyritous lead formation.—3. The noble lead; and 4. The barytic lead formations. This order also represents their respective ages, though the last is much younger than the three first ones, which are nearly of the same age. The copper lodes are merely modifications of No. 2—*i.e.*, copper ores predominate in these particular lodes of lead. The lodes of the noble quartz formation consist of white quartz, with free fragments of the country rock lying in them; the ores are very rich silver ores, but they are only found in small quantities, and are very generally "nested" pyrites; galena and blende occur only in a subordinate degree, as well as strontianite, limonite, copper pyrites, mangan blende, &c. The quartz gangue is always very firmly united to the wall-rock; over 150 of this class of lodes have been discovered in the district. The pyritous lead formations consist principally of sulphurets and quartz, occasionally copper pyrites predominates. Silver ores only rarely occur. This formation occurs chiefly in the south-east of Freiberg. The prevailing gangue of the noble lead lodes is carbonates combined with quartz, the chief ore being galena tolerably rich in silver, combined with blende and pyrites. Heavy spar forms the principal gangue of the barytic lead formation; it is remarkable that this gangue forms parallel and symmetrical layers, between which are thin banks of galena, blende, pyrites, and fluor-spar, and that in the centre of the lode large cavities frequently occur, in which crystalline forms of great beauty are deposited. The fissures in which these lodes occur appear to have been repeatedly burst open, so that fragments of the lodes have been cemented together again by a more recent crystallisation of the same minerals; and, moreover, more recent minerals appear to have been formed in the same fissure with the older ones.

Baron von Beust attempted to divide all the Freiburg lodes into four groups, according to the direction of their strikes—1. Direction of strike from N.E. to S.W.—2. S. to N.—3. N.W. to S.E.—4. From both N.E. to S.W. There are many lodes, however, that strike in totally different directions, and it is impossible to classify them in such groups. The quantity of ore in these lodes is very unequal, even in the same lode, and furnishes a strong basis for the argument of the influence of the country rock, which is one of the most interesting questions in geology, and which I will here endeavour to explain as briefly as possible. Although nothing definite has been as yet determined, still the most probable theory is that the deposits are affected by one of the following six causes—1. The ability of the rocks to conduct heat.—2. Their density.—3. Their porosity.—4. The relative smoothness or roughness of the faces of the fissures.—5. The chemical reaction of the ingredients contained in the rock; and, lastly, electric currents. It is impossible here to go into these difficult subjects more fully, but we can only state that the variatio in the enclosing rocks exerts an undeniable influence on the matter filling their lodes. Certain rocks can be termed "ore carriers," at least locally, while others are the reverse.

As a rule, in the Frieberg district every modification in the rock is accompanied by a corresponding change in the matrix of the lode. These lodes were undoubtedly filled by infiltration; their banded texture, their mineral succession, and frequent impregnation of the country rock, all point to this manner of formation. Infiltration means that the matter was dissolved out at great depths and deposited in the fissures. The nickel-cobalt district of Schneeberg consists principally of mica-schist and clay-slate, broken through occasionally by granite masses; the lodes occur nearly always in the two former, and but rarely in the latter. There are other lodes worked at Schneeberg, but the cobalt ones are by far the most important; over 150 are known. The chief matrix is hornstone, with a little chalcedony; this hornstone forms the oldest layer, and three or four other layers succeed each other, which contain an extraordinary variety of minerals. About 60 iron lodes are known in the neighbourhood, mostly occurring at the outer limits of the granite. One lode, called the Rothe Kamm, forms a complete contact lode along the boundary of the Oberschlema granite. These Schneeberg lodes were formed also by infiltration, but must have undergone an extraordinary number of transmutations subsequently, and they are all younger than the granite. In the Altenberg "zwitter" a very remarkable circumstance is observed. A very fine granular granite occurs alongside of and passes into the zwitter, and is traversed by a number of small and irregular quartz veins, in which are observed occasionally the same description of minerals which occur in the zwitter. The quartz veins are bordered by broad dark stripes, more or less, like the zwitter itself. But the zwitter itself, where it is worth exploiting, is traversed by precisely similar quartz veins. The question then naturally arises, Was not the zwitter itself once a fine granular granite similar to the adjoining rock, but into which solutions of tin were forced? If this theory be true, the solutions of the metals have combined with the quartz and mica in the granite at the expense of the felspar, and according as the changes have taken place, completely or partially, there has been formed true zwitter, or only granite traversed by zwitter.

As far as regards studying at the mining acadamies of Frieberg or the Hartz, I am surprised that more Englishmen do not avail themselves of the opportunity. Probably more real work is done at Clausthal than at Frieberg, but then Frieberg has the best professors, and is the "swell" place of the two. Living at the Hartz is much cheaper than at the other, and a student can pay his fees and go through his course for less than 100*l.* per year, living economically. Assaying is taught more practically at the Hartz, and altogether, is more suited for a man of moderate means. Life at these acadamies is tolerably pleasant, and amusements cheap, while the professors are only too willing to show everything to an enquiring student, in which they form a pleasing contrast to some of our English teachers, who profess often enough to teach everything, but forget to show the most important facts.

HUGO COOKESLEY,
Editor of "Plattner's Blowpipe Analysis."

THE NICKEL AND COBALT MINES OF NEW CALEDONIA.

SIR,—Having recently noticed a telegram from Melbourne in the *Times* about the rich discoveries of nickel, &c., which have taken place in New Caledonia, I will, with your permission, state a few facts in connection with the matter which may be interesting to your readers, and as I have but just returned from New Caledonia I can confidently do so.

The nickel ore is found in vast quantities about 12 miles from Noumea (which is the capital of New Caledonia), at a place named Mount d'Or. This mountain is about 1700 feet above sea level, and it appears to be one mass of nickel ore and chrome iron. Large quantities of the former have been taken from one of the principal mines (Percy and Kelly's) and submitted for treatment to the leading professors and geologists in Sydney, and the following are their reports:—Assay made by Prof. Liversidge (of the Sydney University), No. 1 specimen, 7·39 per cent. pure nickel; No. 2, nickel on casing in vein of chrome iron, 3·26 per cent. metallic nickel; No. 3, the quantitative assay by Dr. Liebus (Sydney Mint) gives 6·19 per cent. metallic nickel. The analyses by Dr. Liebus (at the request of the Rev. W. B. Clarke, the eminent geologist) give—No. 1, 6·46 per cent. metallic nickel; No 2, 24 per cent. metallic nickel. The gentlemen above named consider that the dressed ore will yield not lower than 15 per cent. of metallic nickel, and the undressed ore about 6 per cent. ditto. There are at present but two claims at work—The Grand Mount d'Or and the Percy and Kelly Company. Both mines are, without doubt, remarkably rich, not only in quality but also in quantity, in fact, the ore has simply to be quarried out. Chromate of iron also exists on the surface all over both mines, and it is of excellent quality, and could easily be shipped to here, for it lies about in heaps a foot or so thick. Permanent lodes of this metal, as well as the nickel, have been found, and also traces of silver ore. Prussia will have no cause to feel anxious for a good supply of nickel for its current money, as there is enough in and near Mount d'Or to supply the whole world for some years to come.

One great drawback is the want of nickel works and capital, and the proprietors of both the mines I have mentioned are now shipping the ore in its rough state to Europe; the former, I believe, to Belgium, and the Percy and Kelly Company to Birmingham. I feel pretty certain a great day is in store for New Caledonia, and with its copper, nickel, silver, gold, chrome iron, coal, and a host of other minerals, I stamp it as an island that will certainly surprise Europe before very long.

I shall be glad to let you have further articles, should you deem them worthy of insertion. NOUMEA.

[We shall feel obliged if our correspondent will favour us with further information.]

COAL MINING ON THE KANAWHA, WEST VIRGINIA.

SIR,—As a shareholder in the Gauley Kanawha Coal Company, I shall feel obliged if you will afford space for the accompanying extract from the New York *Engineering and Mining Journal* of May 1. The slip was forwarded to me by an American friend, knowing I was interested in the company, and I considered the best course would be to send it you, that you might, by giving it publicity in the Journal, enable Prof. Ansted, or some other party concerned, to offer such explanation as will allay the apprehension that such news must excite in the minds of English investors.

May 13. A SHAREHOLDER.

"Our advices from this magnificent coal field are very discouraging. The Gauley Kanawha Coal Company, about which so much has been said, and about which the stockholders know apparently so little, figures largely in this report.

"THE GAULEY KANAWHA COAL COMPANY.—The contractor for the branch railroad, Mr. Mason, is prosecuting a suit against the company, but we understand funds have been, or are to be, sent from England to settle his claim. When the

mine boss seeks a situation as common miners, at other mines, for his two sons, it would seem that but little is being done. The company is doing nothing with lumber, on which the last report to the company stated there was an enormous profit—in fact, we think the stockholders of this concern are likely to have a fine opportunity for the exercise of at least one virtue, and will, perhaps, have less confidence in Prof. Ansted's reports and estimates by the time they get dividends than when they invested on their faith in him. The company has, we understand, just purchased a small locomotive for their branch road, a sign that further instalments of British gold must be finding their way over here. The grading and ties are ready for the rails. An incline 1000 ft. long, 600 ft. perpendicular, to reach the cannel seam, over the 11-ft. seam, has been commenced, and three entries are being started—one of them is in 15 ft. Thickness of cannel said to be from 2 to 3½ ft. in a seam of other coal. Nothing is to be done with the soft coal at present. It was on the mining of this, we believe, the dividends of the company were predicted."

RAISING WATER FROM MINES.—INVERTED PLUNGER PUMP.

SIR,—I was applied to some time since by a party who was in this difficulty. His pump was rather too small for draining the mine, and it would have been inconvenient to put in another column, the present column being only sufficient for the pump then in use. He applied to me as to the simplest and best mode of putting in another pump, to be worked by the same rod, so arranged that whilst one pump would be lifting the other would be forcing, and thus obviate the inconvenience and expense of another column. If any of your readers are in the same difficulty my answer may be of interest to them.

The plan is very simple. You have a plunger attached to your main rod, extending downwards from the set-off. Put in another pump with the plunger reversed, extending from the set-off upwards into the pump. In this way the pumps would work alternately, whilst one was lifting the other would be forcing.

Albert Mine, New Brunswick, April 23. CORNISH ENGINEER.

EBERHARDT AND AURORA MINING COMPANY.

SIR,—The information to hand fully confirms the opinion I have so often expressed in your columns as to the value and producing capabilities of our mine, provided its development be properly conducted, and its ore properly treated. It will probably be recollected that at the formation of the company the large profits estimated to be realised were based upon an average assay value of $40 per ton—upon this the shares advanced to 30*l.* each. Mal-administration and inefficient management brought the enterprise to the verge of dissolution; now, under more practical and less ornamental management, the property is beginning to prove its real and intrinsic merits—the assay value of the ore is 13*l.* 6s. per ton (more than $66); the ore milled during April was 1203 tons, of the assay value of 16,015*l.*; the bullion produced 13,194*l.*, the percentage obtained being 82 per cent., the mine looking well. I observed you mentioned last week that the profit for April was expected to be about 7000*l.*, and (although the amount has not been stated) it may, I think, safely be calculated to have exceeded that estimate.

The altered and improving position of this property is only another example of the manner in which the best mines may be made failures by imperfect management. As far, however, as our mines are concerned, they have now been placed on a satisfactory footing, and under the present able and experienced manager will soon begin to return to the shareholders the remunerative dividends anticipated at the formation of the company. A SHAREHOLDER.

May 13.

RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—I am glad to find that some of my co-shareholders have at length come forward to deprecate and expose the unwholesome speculation—nay, positive gambling—to which our property is subjected. I am well aware I am treading upon dangerous ground, but when those entrusted with the conduct of mines are found trafficking in the shares of the property they are well paid to supervise, it is high time that some decisive step be taken to prevent such a crying evil, inevitably resulting in disaster to the shareholders, and in nine cases out of ten to those also who are so forgetful of their trust. It is my purpose at the forthcoming meeting to enquire the extent and number of the speculative operations in which each official has been interested. I am aware what the Chairman's reply will be—"That so far as I know there have been no speculative operations on the part of any servant of the company." I shall then enquire—"Is not the Chairman aware that a considerable number of shares had been bought at between 6*l.* and 7*l.* per share on behalf of prominent officials, and that such shares had been placed in the names of other people until the market price had been forced up, and then sold?" As this operation is now in progress it may be safely assumed that the whole of these shares will be realised before the meeting, and some "unforeseen contingency" may then arise adversely affecting the price.

I now come to another question in which investing (in contradistinction to speculative) shareholders have a direct interest—what are the probabilities that our returns may be increased without unfairly infringing upon the future? It is not sufficient, to my mind, to be informed that there are two years' "reserves" in the mine, bitter experience having taught me that by one of those "unforeseen contingencies"—which, however unforeseen, always occur—it may become absolutely imperative to use the whole of this so-called ore-reserve as working capital. We must not shut our eyes to the grave fact that we are positively without working capital or money reserve—that, in other words, we are sorely tempting fortune. The very fact that we have been so far unexpectedly and exceptionally successful in our explorations is, as all practical miners will tell us, the greater reason that adverse fluctuations in the value of such an erratic deposit will surely be encountered, and no one can tell how soon. To be without a reserve fund or ample working capital in the working of a mine like Richmond may, by the occurrence of some unlooked-for hapless event, endanger the very existence of our enterprise, to say nothing of its profitable career.

We were told that in the Emma there were sufficient reserves to ensure profits for years to come, and this, too, upon the authority of Professor Silliman, represented to be the greatest and most trustworthy authority upon such subjects; the same, also, was said of Mineral Hill and others. The miserable result only too plainly shows how fatally delusive are such statements, even when based upon apparently reliable computations.

But my principal object in troubling you with this communication is to warn others against being led into the belief that the Richmond Mine will continue to be the one and only exception to the crop of failures with which we are all but too familiar. Up to the present time Richmond has opened out well, and if it had not done so its 54,000 shares would not now have been worth as many shillings, but it is an obvious injustice to the mine itself to resort to all sorts of means to induce purchases to be made at quotations which dividends cannot possibly justify. Disappointed shareholders must thus be introduced, committees of investigation appointed, and discord reign supreme where harmony and satisfaction would have prevailed had the mine been allowed to stand upon its merits, uninfluenced by speculative movements.—*May* 12. ANOTHER SHAREHOLDER.

PORT PHILLIP AND COLONIAL GOLD MINING COMPANY.

SIR,—The letter of your correspondent, signed "Justicia," I consider very practical and satisfactory, especially wherein he states "that the Port Phillip Mines are considered to be the very eyes of the gold mines in that rich auriferous locality." I think after the quartz has been struck 1½ oz. of gold per ton in the eastern reef, and ⅝ oz. per ton in the western, it needs no confirmation from my pen to show the truth of this assertion. I venture now to offer some information on the mine. Besides the reserve funds of some 8000*l.* (with cash in hand), there are 2500 reserved shares (unissued). The mines are situated at Clunes, and are (*via* Geelong) about 100 miles from Melbourne, but a railway has been opened recently to Clunes, which will be the means of getting fuel much cheaper, at present representing a cost of 3000*l.* per annum, generally purchased from January to May, when the roads are in the best state of preservation for cartage, that is after the wool season, the draymen at this time being more at liberty to contract for supplying wood from the forests. The fact of there being large buyers of Port Phillip shares for investment tends to strengthen the upward movement of the market. I notice the *Standard* of the 11th inst. gives some very stale intelligence, long since forestalled by the telegraphic message and advices. That a demand for these shares is already manifest, and with such long-hoped-for, and at last realised, extraordinary riches, it is more than evident that very enormous returns must reach this country by very early steamers.—*Stafford, May* 12. COLONIAL NUGGET.

PORT PHILLIP AND COLONIAL GOLD MINING COMPANY.

SIR,—I perceive by the two last advices that only about one-half the amount of quartz is crushed to what they formerly did. How is this? Surely they are not crushing for the Victoria Company. I also perceive with regret that the shareholders are not favoured with advices, except old ones, or two to three months since. Surely the directors are not share jobbers, and take this advantage of their clients; if so, it is far from right, and I, for one, resolutely oppose it. Why cannot the directors give the March return, which is certainly in hand? I agree with "Justitia," and think that they ought to divide, but it is not as it was during Mr. Powles's administration. FAIRPLAY.

CALDBECK FELLS CONSOLIDATED LEAD AND COPPER MINING COMPANY.

SIR,—In reply to "A Shareholder," I believe that no surplus can arise for dividends by the present method of development only. I would refer the writer to Capt. Hawkes's report, dated Feb. 10, 1874, for the half-yearly general meeting of shareholders. It appears that there is no other method of development in order to realise its great mineral wealth. And had his recommendations been adopted and carried out under his supervision, I am quite satisfied that the new capital would have placed the mine ere long in the Dividend List second to none. But the opportunity is by for the present company, their new capital is about expended.

May 10. MINE ADVENTURER.

GREAT LAXEY MINING COMPANY.

SIR,—Please give insertion to the enclosed in next Saturday's Journal, and oblige, JONATHAN DEARDEN.

Bolton, May 13. *Little Bridge Mill, Bolton, April* 29.

SIR,—The half-yearly accounts submitted to the Great Laxey meeting, held in London a year ago, showed an available balance (exclusive of toppings, &c., to be re-dressed, estimated at 8000*l.*) of 5736*l.* 3s. 2d., upon which a dividend of 6s. per share had been declared by the directors the day previous to the meeting, which would absorb 4500*l.*, leaving a balance to carry over of 1236*l.* 3s. 2d.

The half-yearly balance sheet submitted to the meeting on April 14 exhibits an available balance of 13,159*l.* 5s. 8d. (also excluding toppings, 9029*l.*), and upon this statement of accounts the directors declared a dividend of 6s., and set aside 2000*l.* to a reserve fund, absorbing together 6500*l.*, and leaving a balance to carry over of 6659*l.* 5s. 8d., in contrast with the balance of 1236*l.* 3s. 2d. at the corresponding period of last year. It will be seen that the sum retained in hand by the directors on this occasion, after paying out the dividend and reserve, is larger in amount than the balance available for dividends a year ago. As a consequence of this many proprietors I have come in contact with look upon the dividend now given as less than the earnings of the mines would justify, and, contrasting it with the accounts and dividend a year ago, are unable to see any settled plan or principle on which the directors proceed in distributing the profits of the mine. I have had many enquiries addressed to me on the subject by shareholders, and to be able to answer such enquiries, and also for my own satisfaction, being the holder of over 300 shares in the company, I trust you will excuse my asking you for some statement of the reasons which have prevailed with the directors to declare a 6s. dividend, when the accounts and reports of the mine seem to justify double the amount? I make this enquiry in good faith, and believing you will be able to show some cause more reasonable than mere caprice on the part of the directors.

G. W. Dumbell, Esq., Douglas, Isle of Man. JONATHAN DEARDEN.

The Great Laxey Mining Company (Limited), Douglas, Isle of Man, May 3.

SIR,—I am quite willing to give the explanation of the half yearly balance-sheet you ask for, though I am surprised it did not occur to yourself upon the slightest examination of the accounts. The balance as you state is 13,159*l.* 5s. 8d., but not as you state "an available balance," for it is plainly set forth that such balance includes 12,680*l.* 7s., value of ore on hand; this, when deducted from 13,159*l.* 5s. 8d., leaves only an available balance at that time of 478*l.* 18s. 8d. Subsequent sales gave us, if not actual cash, bills in hand, which enabled us to pay the dividend and commence a reserve fund. No persons are more interested (personally) than the directors in making large dividends.—Your obdt. servant, G. W. DUMBELL.

Mr. Dearden, Little Bridge Mill, Bolton-le-Moors.

Little Bridge Mill, Bolton, May 7.

SIR,—I was in hopes your reply to my enquiry would have shown some intelligible basis upon which the directors distribute the profits of the company to the proprietors, but I must admit my disappointment. I drew your attention to the fact that a 6s. dividend was declared at the last meeting from a half-yearly statement of accounts, which showed a balance of 13,159*l.* 5s. 8d., while at the corresponding meeting, a year ago, a similar dividend was given from accounts showing a balance of 5736*l.* 3s. 2d. You state in explanation that the balance of 13,159*l.* 3s. 2d. was not available for dividend, inasmuch as it included the sum of 12,680*l.* 7s., being the estimated value of ore on hand, leaving an available surplus of only 478*l.* 18s. 8d. Turning to the balance-sheet of a year ago, I find a similar condition of things then existing, and the balance of 5736*l.* 3s. 2d. is only obtained by taking it into the account of the stock ore on hand, amounting to 7426*l.* 16s.; and, setting this aside, the balance becomes a deficiency of 1690*l.* 12s. 10d. You further observe that subsequent sales—namely, between Feb. 5, when the half yearly account was made up, and April 14, when the dividend was declared—enabled the directors to pay the dividend and appropriate a sum of 2000*l.* to a reserve fund. Again, making a comparison with respect to these subsequent sales with the same period a year ago, I find the sales between Feb. 6, 1874, when the balance-sheet was made up, and the middle of April, when the half-yearly meeting was held, and the dividend declared amounted to 8595*l.*, while during the same period of the present year they have amounted to 16,855*l.*, and it occurs to me that the largely increased sales of the present year materially weaken the force of your explanation. It is, in fact, impossible to avoid concluding, from a comparison of the two balance-sheet and surrounding conditions, either that the dividend a year ago had not been earned, or that the present one is much less than the profits would justify. I do not see in either case that any reasonable system or principle has been acted upon by the directors in distributing the earnings of the property; while unquestionably, in the latter case, profits which ought to have been put in possession of the shareholders have, for some cause which does not appear, been witheld from them. The company had in February a larger balance by 7423*l.* than at the same period of last year. The subsequent sales, up to the period of the half yearly meeting, were nearly doubled, being 8260*l.* In excess of the same period of last year, and we have it on the most reliable authority that, with this increased production, there are greatly diminished expenses at the mines; but still the directors can only afford to distribute the same dividend as was given a year ago. Under these circumstances I cannot avoid expressing the conclusion I have most unwillingly come to—namely, that the earnings are not distributed to the shareholders upon any satisfactory system, but are too much dependent on the exigencies or caprice of the directors. Your concluding remarks, that "no persons are more interested (personally) than the directors in making large dividends" does not occur to me as having any close application to what is purely a question of figures and account. I shall wait to see if you desire to make any further observations before this correspondence is published.—Yours truly, JONATHAN DEARDEN.

G. W. Dumbell, Esq., Douglas, Isle of Man.

TYLLWYD MINE.

SIR,—I have read with interest the letters of your correspondents on this mine, and my deductions are these.—1. That Mr. Forrest is a very agreeable and polite gentleman, but has but a limited knowledge of the subject he attempts to handle—the practical working of the mine.—2. That no sales of ore have been made, or are likely to be made, which will justify the expectations held out by the report.—3. That the shares of the company have not been taken up.—4. That a large number remain in the company's hands for which there are no applicants whatever.—5. That the mine is situated in a district which never yielded anything but losing mines—the Rheidol Valley—a poor neighbourhood in a poor country. Out of all the mines in Cardiganshire, and there are some 120 mentioned in Absalom Francis's book on Cardiganshire Mines, not more than two of them pay a dividend, though the market for the metal is extremely good. Tyllwyd is, no doubt, as good, if not better, than many of its neighbours, but to what does this amount? There is one answer, one only, which can only be made by sales of ore. To have discovered ore may mean anything. You may discover 20s. worth of lead ore which may cost you 30s. to send to market. CADWALLADER.

TYLLWYD LEAD MINE.

SIR,—If one could only rely upon the genuineness of the enquiries and the figures quoted last week in the Journal it would be very satisfactory to the shareholders, but when we see report after report procrastinating the time for getting lead saleable to meet costs would it not be better instead of puffing prices to puff the quantity of ore for sale? As we were promised that ore was to be ready in March last, and that time has passed by, so has April, and May fast passing, I think the shareholders are entitled to an explanation of what is really the cause of this delay, and instead of being bewildered as to the prices of shares that do not really exist, and I may safely say are not obtainable. Perhaps Capt. Absalom Francis, who appears to be their champion, will give us a few remarks on the subject if Mr. Forrest should not condescend to do so? If I mistake not the chief promoter of Tyllwyd, who was at one time the largest shareholder, was also a shareholder and director in West Esgair Lle, and about two years since favoured the shareholders and public with his report of that mine, wherein he spoke of an inexhaustible body of lead ore already discovered. Where is it? There has been no sale of lead ore from that time to this from that mine, and shares, which were then 3½ to 4, are now sellers at 19s. It is to be hoped Tyllwyd shares may fa better. AN OLD MINER.

[For remainder of Original Correspondence, see to-day's Journal.]

GAS.—Mr. S. HOLMAN, of Laurence Pountney-lane, has patented some improvements in apparatus used in the manufacture of gas. The first part of the invention consists in the application and use of self-supporting bracketted crossbars for carrying the lids or doors of gas retorts, and in providing eccentric hinge fastenings with supporting pins to carry the said crossbars and lids (or lids without crossbars, as the case may be) without the aid of screws or any other means of tightening or fastening the eccentric hinge joint pins, so that the said joint pins may be very easily and quickly taken out and replaced. The second part of the invention consists in the construction and application of vibratinge hinge joint lugs to carry the crossbars and lids above referred to, and in making the same interchangeable with vibrating catches. The third part consists in the construction and use of the flat cast-iron lids without rims, but with centre lugs on each side, so as to answer either as single or reviasble retort lids by turning the periphery true (and by preference semicircular in form), so that either side of the turned periphery may effect a sound sealing of the retort by direct contact with a true bevil surface formed in the retort mouthpiece, as described in Morton's patent, No. 575, dated Feb. 24, 1869. The fourth part consists in the construction of mouth pieces for gas retorts, the said mouth pieces being provided with recessed or other suitably shaped lugs to receive the vibrating hinge joint lugs referred to in the second part of this invention, so that the said hinge joint lugs may be made interchangeable with vibrating catches, thereby enabling the fastening lever to be placed at either the right or left side of the retort mouthpiece.

FOREIGN MINING AND METALLURGY.

Belgian metallurgical industry continues to suffer from the languor which it has exhibited for some time past; a revival does not appear likely to be witnessed just at present, notwithstanding that the directors of some of the Belgian works are said to be negociating some important contracts. Competition for contracts is just now very severe in Belgium. At a recent adjudication for locomotive axles at Brussels the lowest tender was that of the Marcinelle and Couillet Company; Messrs. Taylor Brothers and Co. and Messrs. Cooper and Co., of Leeds, tendered, but unsuccessfully. The Belgian steel works are pretty well off for orders; there is also some demand for sheets, but merchants' iron is in comparatively small request. There is some demand for rails for tramways just now in Belgium. Luxembourg pig chokes up the Belgian markets, and renders it difficult for Belgian pig to be sold with any freedom. The Great Central Belgian Railway Company did not give out any orders for additional *matériel* last year, but it received in the course of 1874 in execution of contracts previously let fourteen locomotives and two tenders. It is expected that the company will want some more engines shortly. An adjudication for 13 locomotives and tenders is expected to take place in a few days at Aarhus, Denmark. A contract for trucks and Bessemer steel axles and tyres is also about to be let at Winterthur (Switzerland).

A slight improvement is observable in the tone of the various copper markets. At Paris, Chilian in bars, delivered at Havre, has brought 87*l.* 10s.; ditto, ordinary descriptions, 85*l.* 10s.; ditto, in ingots, 88*l.*; English tough cake, 88*l.*; and Corocoro minerals (pure standard), 86*l.* per ton. At Rotterdam, Drontheim has realised 50 fls. to 52 fls.; and Russian crown, 51 fls. The tin markets have remained quiet. Sales of Banca in Holland have been reported at 50¾ fls. Billiton has also been tolerably firm at 47¾ fls. The Dutch Society of Commerce has announced its next sale for the 26th inst.; this sale will comprise 22,800 ingots of Banca. At the close of April, the unsold stock of Banca of the Dutch Society of Commerce amounted to 85,211 blocks, against 102,380 blocks at the corresponding date of 1874, 76,611 blocks at the corresponding date of 1873, 9642 blocks at the corresponding date of 1872, and 44,816 blocks at the corresponding date of 1871. At Paris, Banca, delivered at Havre or Paris, has made 95*l.*; Straits, delivered at Havre or Paris, 89*l.*; and English, delivered at Havre or Rouen, 91*l.* per ton. The quotation for Banca at Amsterdam has been 50¾ fls. to 51 fls.; and for Billiton, 48 fls. Lead has been in good request, but zinc has been rather weak. At Paris, French lead, delivered at Paris, has brought 22*l.* 8s.; Spanish, delivered at Havre, 22*l.*; and Belgian and German, delivered at Paris, 24*l.* per ton. Rolled Vieille Montagne zinc has been quoted at 30*l.* per ton at Marseilles, with a discount of 3 per cent.

Transactions in coal continue difficult in France—in other words, the markets exhibit a complete want of animation. Buyers show little eagerness to close transactions, and the conclusion of no important contract has been reported. An official return which has just appeared shows that in the first three months of this year France imported 1,505,780 tons of coal, of which 549,630 tons came from England, 817,130 tons from Belgium, 138,950 tons from Germany, and 70 tons from other countries. The corresponding imports of the corresponding period of 1874 were 1,529,321 tons, of which 578,078 tons came from England, 613,908 tons from Belgium, 136,560 tons came from Germany, and 775 tons from other countries. Coke was imported into France (principally from Belgium) in the first three months of this year to the extent of 124 300 tons, as compared with 85,567 tons in the corresponding period of 1874.

The Belgian coal trade is still extremely quiet. The production has been reduced, but suffices to provide for the current requirements of consumption, and stocks do not accumulate. A strike which had prevailed in the Charleroi district has terminated, but this circumstance has exerted no influence upon quotations. Although business has been generally quiet, an exception must be made in favour of the Mons basin, in which there is a certain animation. This circumstance is attributable to considerable orders having been received from sugar works in the North of France. In the basin of the Ruhr (Germany), a considerable amount of competition prevails, and prices still rule very low. Contracts have been let this week for 10,500 tons of coal required for the Belgian State railways.

Quotations have remained about stationary in the French iron trade, and the state of affairs has been scarcely more satisfactory this week than it has been hitherto. Foreign competition has rendered the production of both refining and casting pig very difficult; iron is also made with difficulty, as it sells at very low rates, while coal quotations continue very high. The imports of pig into France in the first three months of this year present an increase of 82 per cent. as compared with the corresponding period of 1874; the imports of iron into France in the first quarter of this year were, however, smaller than in the corresponding period of 1874. The pig imported this year was received for the most part *via* the northern and eastern frontiers. The exports of iron and pig from France in the first quarter of this year amounted to 41,864 tons; this total presented some falling off as compared with the corresponding total for the corresponding period of 1874. The imports of minerals into France in the first three months of this year amounted to 176,836 tons; this total presented some increase as compared with the corresponding period of 1874. The exports of minerals from France in the first three months of this year were only 33,800 tons. Some large deposits of ironstone have been discovered in Norway. They are situated near Podoé, about seven miles from the Gulf of Skierstad.

TREATING SULPHURET ORES—THE SONORA PROCESS.

This process was introdueed at La Aguja hacienda, in Sonora, Mexico, in 1869, by Mr. E. B. Smith, and since that time has been adopted by every other hacienda in Sonora. The ore is prepared by roasting in a reverberatory furnace, reducing the silver and baser metals to a chloride. The ore is then charged into boxes prepared with a false bottom, and is then lixiviated with water until the chlorides of the base metals are dissolved and washed out. A solution of hyposulphite of lime is then turned on the ore, which dissolves the chloride of silver. This silver, in solution, is then drawn off into tanks, and the silver precipitated by sulphide of lime. After the precipitation of the silver the resulting liquor is a hypersulphite, which is drawn off and pumped back into the ore tanks, to serve again as a dissolvent of the silver. The precipitated silver is drawn off, strained, and then roasted in a small reverberatory furnace to burn off the sulphur, and then melted in crucibles with iron, or in cupel furnaces with lead.

The advantages gained by this means are—1. The greater reduction of cost in the building of reduction works.—2. The economy of power, as no machinery is used except the stamps for pulverising the ore.—3. Economy of crushing, as much coarser screens can be used in the batteries.—4. Simplicity and certainty of results.—5. Larger percentage of silver obtained than by any other economical means.—6. No patent, no royalty, and no mystery.

Much depends upon the proper construction of the furnaces so as to economise fuel and produce the most perfect chlorinisation, and then on the skill and faithfulness of those in charge of the roasting. The construction of the works should be under the charge of someone thoroughly familiar with the process, so as to arrange all the appliances with a view to convenience and economy in the handling of the ores; but when once so constructed any intelligent worker in ores can soon familiarise himself with all the various manipulations which the ores go through. It takes from one quarter to one-half a cord of wood for roasting. The screens used generally are No. 24, so each stamp can crush a great deal more ore per day than when screens from No. 40 to 60 are used. The cost of working by this process, of course, varies with the locality, price of wood, &c.

At Mr. Smith's hacienda, with a ten-stamp mill, if running steadily, the cost is from $10 to $13 per ton of ore.

The process is now generally used in Sonora, but we do not know that it was ever introduced here. In Sonora they have used the patio, pans, and all other means, but have thrown them out, and now use this process with good results. No chemicals are used, except salt and sulphur. Mr. Smith's mill has been a sort of customs mill for some time, and has worked all classes of ores successfully. The silver comes out generally about 900 fine, although it has been produced as high as 960. The process is specially adapted to rebellious silver-bearing ores, and we hope some of our readers may try it here. It appears admirably adapted for miners who do not want to erect large and expensive works.

— *Mining and Scientific Press* (San Francisco).

Meetings of Public Companies.

NATIONAL PROVINCIAL BANK OF ENGLAND.

The forty-second annual general meeting of shareholders was held at the bank premises, Bishopsgate, on Thursday,

Mr. RICHARD BLANEY WADE in the chair.

The report of the directors stated that the result of the operations for the last year enabled the directors to recommend that the dividend and bonus now about to be declared should be 12 per cent. for the half-year—that is to say, the usual 4 per cent. dividend, with a bonus of 8 per cent., making, with the distribution in July last, 23 per cent. for the year 1874. The abstract of accounts bore evidence of the continued prosperity of the establishment. Considerable additions had been made to the deposits and general business since last report. About 3317 new accounts were opened during the year, in addition to a large number of new deposit accounts. The directors were gratified also to state that the resolution adopted at the last annual meeting to add to the capital of the bank by the issue of 28,125 shares of 20*l.* each had been successfully carried out, and that in consequence the reserve fund had been raised to 742,414*l.* 5s. 2d. When the final instalment of the premium on the above shares, due on July 15 next, shall have been received this fund will amount to the very satisfactory sum of 883,834*l.* 5s. 2d. A small number of these shares (153), from various accidental causes, had not been taken up, and are, consequently, forfeited. These shares the directors proposed to sell at the market price, and to place the proceeds, less the premium of 10*l.* per share, to the credit of the benevolent fund, established in 1871. This fund had already rendered valuable aid to several persons very worthy of support.

The CHAIRMAN, after a few prefatory remarks, drew attention to the fact that since the last meeting of shareholders the old shares of 100*l.* each had been divided into shares of 50*l.*, with 20*l.* paid up, and he thought they would find that the relative prices of the different shares were pretty nearly the same. It would have been well if they could have reduced all the shares to the same denomination; but there were some difficulties in the way of doing that. He had to report that the bank was registered in January last as an unlimited company, under the Act of 1862, and that consequently they were now a corporation. They had already experienced some advantages from that step, but the great point was that the liability of shareholders ceased twelve months after they had parted with their shares, which, in the case of deceased shareholders, might be a matter of importance. The year 1874 had not been so favourable for banking operations as 1873, the Bank of England rate of discount being less. Nevertheless, the directors were enabled to give them a bonus and dividend for the year of 23 per cent., in addition to placing the sum of 20,000*l.* to the credit of the building fund. The next point to which he would call attention was that the accounts again showed a considerable increase in the deposits, both in London and the country. With regard to the balance-sheet, anyone looking at it would see that the bank was in a position of considerable strength. In the month of July they would have a sum of 833,834*l.* credited to the reserve fund. He had no doubt that in a few years that fund would amount to 1,000,000*l.*, and they would not be content until it amounted to that sum. They had now a capital of very nearly 1,400,000*l.* paid-up, and they were in a condition to undertake any business which might be brought to them. They were strong in their financial position, and they had a very efficient staff wherewith to conduct the business. He could not leave the question of the staff without alluding for a moment to the paragraph in the report in which they proposed, with the concurrence of the shareholders, to apply the premiums which they might derive from the sale of the forfeited shares to their benevolent fund. Of course, in a large establishment like theirs there were sad cases which came before them of families of their deceased clerks, who had not had time to make a proper provision for them, being reduced to great straits, and the benevolent fund was designed to relieve such cases; and, therefore, he was quite sure that the directors would have the support of the shareholders in what they proposed to do in this matter. The only other subject to which he wished to allude was the establishment of Scotch banks in the county of Northumberland. The directors felt that that was a measure which the Scotch banks were not justified in taking; that it was not right that Scotch banks, having greater privileges than English banks possessed, should be allowed to compete with English banks. The banking community was united on this subject, both in London and the country, and at their instigation Mr. Goschen had brought the matter before the House of Commons, and a Select Committee had been appointed, which was now considering the subject. In conclusion, he moved that the report be received and adopted.——Mr. J. O. HANSON seconded the proposition.

Mr. CASTELLAN and Mr. REEVE congratulated the directors upon the satisfactory report which the directors had submitted, when the motion was put to the meeting, and carried unanimously.

The retiring directors, Mr. J. Kingston (who, it was stated, was first elected in 1845), Sir James Sibbald David Scott, Bart., and Mr. Duncan Macdonald, were unanimously re-elected.

Votes of thanks were passed to the Chairman and directors, and also to the joint managers (Mr. Edward Atkinson and Mr. William Holt), and the other managers and staff, both in London and the country, for their able and efficient management of the business of the bank during the past half-year.

Mr. ATKINSON acknowledged the vote on behalf of himself and colleagues.——The meeting then separated.

CONSOLIDATED LAND AND INVESTMENT CORPORATION.

The statutory meeting of shareholders was held at the London Tavern, Bishopsgate-street, on Thursday,

Mr. H. RUSSELL EVANS in the chair.

Mr. SAMUEL MACDONALD (the Secretary) having read the notice convening the meeting,

The CHAIRMAN said that they were aware this was a statutory meeting, and that it was not usual—indeed, it was impracticable—to present accounts; but he might remark that in the establishment of the company the first principle which they had kept in view had been that of securing safety with regard to their investments. Some proposals had been laid before them, and one especially was now under their consideration which, if carried out, will yield a large profit to the company, and extend its business materially. They had the experience of other land companies to guide them, and would thus be enabled to follow the examples they had successfully adopted. The company was not at present a large one, but they hoped, by gradual and safe steps, to extend its business and increase its profits. They would be prepared to receive money on debenture or deposit from shareholders or their friends, so as to extend the business as rapidly as possible with safety to those concerned.

Mr. DAVIES (a director) remarked that his connection with the company had been of very recent date, but the knowledge he had acquired of it enabled him to justify the statement that the Chairman had made. He had no doubt it was the nucleus of a large business, and he felt that those who preferred small profits with safety to large profits with greater risk might associate themselves with them. Their business was not of the extent he could have wished, but they hoped to extend it, and he could assure them that the directors would not consider their own remuneration until they had well cared for the interests of the shareholders. There was one matter, as the Chairman had mentioned, which if carried out would tend to the benefit and interest of their company.

Upon the proposition of Mr. C. MORRIS, seconded by a SHAREHOLDER, thanks were voted to the Chairman, and the meeting separated.

OAKWELL COLLIERIES COMPANY.

The annual general meeting of shareholders was held on Wednesday, at the London Tavern,

Mr. CORNELIUS WALFORD in the chair.

Mr. H. BUCKNALL LITTLEWOOD (the secretary) read the notice calling the meeting.

The CHAIRMAN said the meeting had been called somewhat in advance of the time originally intended by the board, and the principal reason why it was thus called earlier was that it became desirable to raise a certain amount of capital by preference stock. The directors had not intended to call the meeting until they had succeeded in raising the preference stock, but several large shareholders expressed an idea that they would like to know the position of the company before they subscribed, and, therefore, the present meeting had been called. No report or balance-sheet had been printed, but a balance-sheet had been drawn up; but if they had waited a little longer before the meeting was held some of those items would have assumed a somewhat more settled and definite form than at present. He went on to read the items in the balance-sheet, and said that the profit against the company on the past 14 months' trading was 2018*l.* The directors had been struggling for a long time past to place the company upon a sound business footing, but the difficulties with which they had had to contend had been so great that they had not yet been able to do so. When the company was first started there was but a small amount of capital subscribed, but the idea and belief was that if the company answered the purpose for which it was intended—to supply coal at a reasonable rate to its members—that the money required would come in. Upon that theory the directors acted. They found they had a good pit, but there was only one shaft, and that shaft was not capable of producing an output sufficient to supply all its members. The directors, therefore, considered it most desirable to sink another shaft, with the sole view of putting the company in a position and on a footing to supply all the shareholders present and future He was bound to say that at that point the mistake arose, because it would have been as much as the directors could do to pay the purchase-money of the colliery, without entering into its further development. It took a long time to sink a shaft, and whilst the shaft was being sunk the shareholders became impatient, and money ran short, and the directors found themselves unable to complete the second shaft and supply the shareholders with coal. He believed that at the present time the colliery and the new works were worth in the aggregate the sum which had been spent—28,000*l.*—although, perhaps, if they were pushed to a sale at the present time they would not realise the full amount expended in connection with them, as the circumstances were now very much altered. At the same time, they believed the colliery was a very good property, and they intended to develope it. He did not deny that the directors might have made some mistakes, but everything which they had done had been done with the honest intention of carrying out the original intention for which the company was formed. The mistakes had simply been such mistakes as men of business were liable to make from time to time. The great difficulty with which they had to struggle was the small amount of capital with which the company started. They knew the colliery was a good one, and believed that the original intention of the vendors would be carried out ultimately, but it must be clearly understood that the directors wanted assistance from the shareholders, for it could not be expected that gentlemen should act as directors and also as bankers of the company. He pointed out that if the company failed the shareholders would lose their money, whereas if it were made to succeed the shareholders would possess a property which would be valuable for many years to come. It was for the shareholders to say whether they would assist the board in carrying the company forward. He could only say that the present board were perfectly ready to place their seats at the disposal of the shareholders, but he could only say that the present board had done all in their power to make the company successful. He moved the adoption of the report and accounts.——Mr. SMYTHE seconded the resolution.

Mr. J. H. APTED drew attention to the large amount which appeared to be due from the agencies, and asked whether the agents were allowed to retain money in their hands?

Mr. KNOWLES asked whether the directors were not required by law to send the balance sheets round to the shareholders before the meeting?

Two or three shareholders expressed an opinion that it would be advisable to adjourn the meeting in order that the balance-sheet might be sent to the shareholders, who would thus have an opportunity of making themselves more thoroughly acquainted with it.

Mr. CACHEN, the vendor of the property, said the past management had not been what it ought to have been, but he believed the property still to be a very good one, and that with a judicious expenditure of a small amount of money, and proper management, good results would still be obtained by the members.

A long and uninteresting discussion ensued, and the Chairman replied to several questions. In the end a committee of investigation was appointed, who will fully enquire into the position and prospects of the company, and report to a future meeting, to be called within 14 days. The meeting then broke up.

SCOTTISH AUSTRALIAN MINING COMPANY.

The half-yearly general meeting of shareholders was held on Monday, at the London Tavern,

Mr. A. W. YOUNG, M.P., in the chair.

Mr. C. GRAINGER (the secretary) read the notice convening the meeting; the report of the directors was taken as read.

The CHAIRMAN: Gentlemen, I think we may say we are fairly prosperous. The sales for the half-year ending Dec. 31 last are less than they were at the end of the corresponding half-year of 1873. That, of course, may be accounted for in various ways. The principal reason of this falling off in the vend is that we had sold on English account less this half-year than we did in the corresponding six months of the previous year; of course, that arises from the state of the coal trade in this country. Naturally there is less inducement for people now to send out to Australia for coal when they can get it cheap here with low freights. I know I have said it often before, but I may repeat it to-day, that this is a question bearing a great deal more upon the amount of freightage offering in New South Wales than upon the price of the article itself. There have been two new collieries opened since this time last year. They had, of course, competed with us. Naturally, the more competitors you have in any particular trade the less of that trade you are likely to have; at the same time we have to report this—that the general coal trade of the colony is improving. From the colliery we had made a sum of money sufficient to enable us to divide a fairly-earned dividend of 12½ per cent. I have had taken out the exact figures, by which we show the exact cost per ton of the coal we raise, and what it has produced per ton. If any gentleman really wishes those figures I can give them in a moment; but I do not knew whether it is altogether politic to exhibit those minute details. The news by this last mail is satisfactory. Arriving only this morning we are able to report the state of our sales for the first three months of the current half-year—that is, January, February, and March. They amount to 9874 tons in January, 12,586 in February, and 9600 in March: total, 32,062 tons. The sales of the three corresponding months of last year amounted to 27,000 tons; therefore, the difference between 27,000 and 32,000 tons is the increased vend for the first three months of the year. That looks satisfactory for the coming time. Late last year, or at the commencement of this, Mr. Morehead thought it expedient to send down Mr. Shannon, our second officer at Sydney, to Adelaide and Melbourne, with the view of looking up customers, and his visit has resulted in contracts being taken with certain people, which are now beginning to show fruit. We hope and believe that this will be a satisfactory move in our trade, (Hear, hear.) Well, gentlemen, so much for the coal business; but you all are aware that we have other properties beside coal. As regards the Cadia property, the miners who took it upon royalty did not find it answer their purpose after a time; and, although there is undoubtedly gold there, they having raised 237 ozs., and, if properly worked, in paying quantities, these men had not the means and appliances of realising a success. There has been more than one suggestion that this property should be made over to a separate gold and copper mining company. We know the difficulty in these days of persuading anybody that any good will come out of any speculation; but it is quite possible that a company formed for the express purpose of working the property would be a success, whereas we are hardly in a position to do so, the shareholders having at various times expressed a disinclination that we should go on to any very great extent into these operations. If, however, any gentleman has any serious idea that any reasonable arrangement can be made with other parties to work this property, we retaining an interest in it, we should be most happy to meet them and go into the matter. There is a railway going west, and will pass within a very short distance of the Cadia property; but I fancy it will be a considerable time before it is constructed. I do not think it is yet near it; but it is going in the right direction, and will eventually pass within 10 miles of the place. You may, perhaps, remember that on the last occasion of our meeting we submitted to you a very interesting report of the proceedings at Rockhampton, where the copper crops out. We have got a letter from Mr. Holman, jun., this morning, which gives a very favourable account of the property. You shall have it read, because it is only right that you should be as fully informed on these matters as the directors. When we prepared the report we had not received this letter, but assays had been made of the ore taken from portions of the copper mine on the property. These are very satisfactory in this view, that they are taken from different parts of the mine, that they are all of them high percentages of copper, and it is to be observed that these assays were made in each case from large quantities of ore—in one 12 tons, in another 4 tons, and in another 12 tons—so that there was a fair bulk from which to judge, and not an isolated stone. Well, gentlemen, as I said, these are satisfactory as far as they go; but still I may say what I have said before, that it is still only a promising and not a performing mine. The land at Newcastle Mr. Morehead thinks very highly of. We have there land to the extent of 10 acres, and the town is increasing. Mr. Croudace has been bringing it into a state fit for building purposes. The property consisted principally of sand-hills; therefore, it was necessary to cover them with grass. This Mr. Croudace has done. Mr. Morehead was there the other day, and says that it is now a very good property, and that we shall be able to let it on building leases. The land will soon be brought into the market. Now, as to the other properties, I am afraid that we have nothing encouraging to say about them. The general coal trade is good. Steamers on the Pacific Coast are increasing in number, and will continue to do so; and, of course, if there be a greater number of steamers the demand for coal is greater. Having regard to all these circumstances, I look to the future with hope that our capital will continue to produce a very reasonable dividend. I hope that when we meet you again we shall have as good and even a better report to submit to you than we have to-day. He (the Chairman) then concluded by moving that the report of the directors be received and adopted, and that a dividend at the rate of 12½ per cent. be declared, free of income tax, the same to be payable on and after the 21st inst.

Alderman Sir CHARLES WHETHAM seconded the resolution.

The SECRETARY read the report made by Mr. Holman on the Rockhampton Copper Mines.

Mr. FREWER said the most disappointing feature he discovered in this report was the falling off in the past half-year's vend of coal. The Chairman had told them that during the past year two new collieries had been started, and had competed with this company. Now, having regard to that fact, he desired to ask whether it would not have been advisable to have opened their Stockton property, and so provided themselves with a second pit to meet the demand arising from any scarcity in the market?

Mr. HILL observed that it seemed to him that, if it were an ascertained fact that ore was to be raised from the Rockhampton property of a certain value, proved to be a paying value, it was advisable to continue and prosecute with vigour those explorations and workings. He strongly counselled the adoption of energetic measures, and considered that they should look to the speedy realisation of this newly-acquired property.

The CHAIRMAN replied that with respect to the working of the Stockton it was a certainty that the fact of the company having that property had prevented their having a very great competitor. The estimated cost of opening up and working the Stockton property was considerable, and he could not individually say the expenditure of such a sum would be justifiable at present. They met all demands for coal at present, and when there was a discrepancy between the company's power of supply and the demand the board would inform the shareholders of the same. As regarded Rockhampton, that was theirs. It was, of course, a matter for them to consider—the extent to which they would go into the development of this property. Very soon, however, the question would be absolutely forced upon them whether they should authorise a more vigorous expenditure in regard to the property, or permit it to remain in its present state. However that might be, he trusted the shareholders would give them credit for doing their best. At present they did not feel justified in going in for an expenditure of some 10,000*l.* (Hear, hear.) Though the coal was at present the only bread-winner of the company, he trusted that the other properties would at some future time come into play for the general good. (Hear hear.)

The resolution for the adoption of the report and declaration of the dividend was then put, and carried unanimously.

The re-election of directors and auditors having been disposed of, a cordial vote of thanks was, on the motion of Mr. HILL, seconded by Mr. FREWER, accorded to the Chairman and board of directors, and the proceedings closed.

CRENVER AND WHEAL ABRAHAM UNITED MINES CO.

An extraordinary general meeting of shareholders was held at the Cannon-street Hotel, on Thursday, for the purpose of considering the present position of the company, and, if deemed necessary, of passing the following resolution, in pursuance of the third clause of the 129th section of the Companies Act, 1862:—

"That it having been proved to the satisfaction of the company that the company cannot, by reason of its liabilities, continue its business, and that it is advisable to wind-up the same, and that the same be wound-up voluntarily accordingly."

And also for the purpose of appointing a liquidator or liquidators to conduct the winding-up of the said company.

Mr. STRATTON in the chair.

Mr. GEORGE H. CARDOZO (secretary) read the notice convening the meeting.

A circular was read suggesting that in the event of a resolution being passed that the company should be wound-up, Mr. Horace Green, a shareholder and past director, should be appointed liquidator.

Mr. ROBERTS said the shareholder who held the greatest interest in the mine would be the best for all concerned.

The CHAIRMAN said Mr. Green held 20 shares, and he (the Chairman) held over 1000, of which 500 cost him 1000*l.* He then drew attention to the circular inviting the shareholders to entrust Mr. Green with proxies, not as a citizen of London, but as a philanthropist who wishes to assist the poor families of Cornwall. He (the Chairman) had no objection to assist those families, but he would do it out of his own pocket, and would be very happy to join Mr. Green in raising a fund for that purpose. At the same time, he was not now going to ask the shareholders in this company to assist those families, but to do the business of the mine, and to continue to do the best for the shareholders, if honoured with their support. It would no doubt (he said) be recollected that at the last meeting he stated two qualified gentlemen had been engaged to inspect the mine, and only the report of one was submitted, because, unfortunately, he had mislaid the other and had never been able to find it; but another copy had been supplied, and forwarded to the shareholders. The second report was from Mr. Woodifield. When Mr. Belt inspected the mine he did not know of that large lode, 6 ft. wide, and producing 5 tons of copper ore per fathom, afterwards increasing to 8 ft., and producing 6 tons. The board were unanimously in favour of continuing the operations at the mine, and did not wish, on any account, that the poor families in Cornwall should starve. He had seen Mr. Woodifield several times before he left to inspect a mine in America, and he felt very strongly that Crenver and Abraham was really a good property; and when they considered who Mr. Woodifield was—that he had managed the Cape Copper Company's mines for several years, the shares in which, with 7*l.* paid, were now selling in the market at 36*l.*—the shareholders would not be surprised to find that, taking into consideration the very strong favourable opinion held by Mr. Woodifield, the directors were all in favour of the company being re-constructed. A gentleman with whom he was not acquainted had been recommended to the board as one well able to voluntarily liquidate the company and also submit a scheme for re-construction which would not disregard the interest of any existing shareholder. The gentleman referred to was Mr. Alfred Good (Messrs. Daniel and Good, public accountants, of the Poultry). With respect to the money that had been expended in searching for copper, a great deal had been found. Six gentlemen had guaranteed for 12 months that Messrs. Harvey and Co. should not lose anything by supplying goods to the value of 15,000*l.*, and instead of driving the matter off, they had taken time by the forelock, and consulted as to what should be done, there being 11 months before the mortgage had to be paid off. He then proposed the resolution embraced in the notice convening the meeting.

Mr. ROBERTS seconded the proposition. He knew the position occupied by Mr. Good in the City of London would justify his appointment as liquidator.

Mr. GOOD said that the Chairman and some of the directors had consulted him upon the position of the company a few days since, and although he had not had time to prepare a statement of the affairs, he had drawn out a rough sketch. The shareholders had subscribed 93,000*l.*, and there had been received from various sources 11,000*l.*; there was owing to creditors 14,000*l.*, making a total of 118,000*l.*

on the debit side of the account. The purchase of the mine was 30,000*l.*, and profit and loss had been debited with 70,000*l.*; in addition to that there was a sum of 14,300*l.* representing the costs of the mine from October, 1874, to March, 1875; there was standing to the credit of forfeited shares account 4000*l.*, from which he did not calculate anything would be realised. The position, therefore, was really this—they had expended the whole of the capital and earnings, and they had nothing to look for except the profits that might be obtained from further development of the mine. If either of the creditors demanded their money, it could not be paid, and unless the shareholders took the control of their affairs into their own hands they would be liable to a compulsory liquidation at the instance of any individual who might have against the company a claim of comparatively small sum. They could not command further capital without some alteration in the constitution of the company, and he recommended the adoption of the plan which he had found worked successfully in other mining companies which had been reconstructed. The plan was to hold out an inducement to the present shareholders in the reconstructed company to come forward and subscribe a small amount of capital. The effect had been that by a change of management, with a little more capital, unprofitable companies had been turned into successful ones.

A SHAREHOLDER said that in effect the financial position of the company appeared to be this—that they owed 16,000*l.*, including borrowed money, against which they had the mines, machinery, and plant.

Mr. GOOD said that was so.

Mr. ROBERTS said the machinery was valued at 24,000*l.*, but it did not seem that they could carry on the business of the company for eleven months at the current monthly expenditure; therefore, he was perfectly satisfied of the advisability of the proposal now before the meeting.

The CHAIRMAN, in reply to a question, stated that the scheme of reconstruction, as had been explained to him by Mr. Good, he entirely approved, because it did not neglect the interest of any shareholder—every shareholder would be considered.

After some further discussion the resolution was put and carried unanimously.

Mr. MONCKTON then proposed that Mr. Alfred Good be appointed liquidator, and that Mr. Stratton and Captain Edwards act as joint liquidators.

Admiral COCHRANE seconded the proposition.

Mr. WIDDICOMB proposed as an amendment that Mr. Horace Green be appointed liquidator, which was seconded by Mr. SEARS.

Exception was taken to Mr. Widdicomb, as his calls were in arrear, and he was a holder of five shares. In order that the question should be tested, Mr. Bramwell consented to move the amendment, which upon being put was declared lost, only three hands being held up in its favour.

The resolution was then put and carried unanimously.

Mr. GOOD said that one of the first things to which he would address himself would be to get a statement as to the exact position of the company, on which figures he would found his reconstructive scheme. The property would be sold to another company, and he should be very sorry indeed to exclude any shareholders whose circumstances would not enable them to render any assistance in the way of new capital, however they might be disposed to do so. In the formation of the reconstructed company an appeal would be made to all the shareholders, giving them the option of subscribing towards the new capital upon preferential conditions, and if some were unable to subscribe that they still should have some kind of interest in the company. In that way the productive capital might be increased and the dormant capital very much reduced; so that by some change in the management, if the statements of the professional gentlemen were at all borne out, the probability was that the mine would be, at all events, not only self-supporting, but that dividends would be realised.

A vote of thanks to the Chairman and directors concluded the proceedings.

EAST POOL MINING COMPANY.

A two-monthly meeting of adventurers was held at the mine, on Monday, Mr. G. A. MICHELL in the chair.

The accounts showed that the labour costs for the two months ending Jan. 30 amounted to 2438*l.* 12s. 2d.; the merchants' bills to 1173*l.* 14s. 8d.; dues, 184*l.* 3s. 6d.; Stannary assessment, 68*l.* 18s. 11d.; rates, 61*l.* 12s. 1d.; the 13th months' cost, 300*l.*: total, 4127*l.* 1s. 4d. The receipts were, for copper ore, 899*l.* 14s. 3d.; tin ore, 2475*l.* 13s. 3d.; tin stone, 1477*l.* 5s. 6d.; wolfram, 320*l.*; arsenic, 743*l.* 10s. Other items made the total receipts 5934*l.* 16s. 10d., showing a profit on the two months' working of 1707*l.* 15s. 6d., and reducing the debit balance from 2457*l.* to about 759*l.* only. The following report was read to the meeting:—

May 10.—Great Lode: The 180 is driven east of engine-shaft 28 fms., and is worth for tin 24*l.* per fathom. The 180 is driven west 39 fms., and worth for tin 14*l.* per fathom. There are four stopes in the back of this level—two east of the shaft worth for tin 20*l.*, and two west worth 16*l.* per fathom each stope. The 170 is driven east about 50 fms., and is worth for tin 12*l.* per fathom. The 170 is west of shaft 51 fms.; this level has been suspended for a time, but in the stope below the 160, over this end, we discover more lode to the south, on which as soon as beaten through we propose to drive. In the back of this level there are four stopes, worth on an average 15*l.* per fathom.—Engine Lode: Two stopes in the back of the 160, on this lode, are worth for tin and copper 16*l.* per fathom each. About 6 fms. to the west of Dennis's cross-cut, and about 10 fms. above the level, at the point where the junction is formed with the flat lode, we have commenced a rise, and over this point at the 140 we have set a cross-cut to drive to intersect the lode, and communicate with the rise; when this is done we shall have laid open a valuable piece of ground. The 155 fathom level, driving east, is worth for tin 10*l.* per fathom.—South Lode: The 160 fm. level is driven west of long winze 14 fms. and east 12 fms.; each end is worth for tin and copper 15*l.* per fathom. Ten fathoms to the west of long winze we have a rise on the cross-course, now 9½ fms. above the level, and in the bottom of the 140 a winze sunk 4 fms. below the level: their communication, which we expect to effect in a week, will be the laying open of a piece of good mineral ground, and give increased facilities for breaking and discharging stuff. The 150 is driven east of eastern cross-course 10 fms.; the lode is large, and worth for tin and copper 16*l.* per fathom. The 140, driving east of long winze, is worth for tin and copper 15*l.* per fathom. The 120 is driven east of cross-course winze 9 fms., and worth for tin 12*l.* per fathom. We have eight stopes working on this lode, worth on an average for tin and copper 18*l.* per fathom each.—J. MAYNARD, J. HOSKING, W. TIPPETT, Managers.

Capt. ABRAHAM JAMES said that of late there had been much discussion at Redruth with regard to certain sales of arsenic from the mine. About 21 tons were sold to Capt. Brown at 6*l.* 0s. 6d. per ton, and he wished to know how it was that Capt. Brown came to be supplied in this way, seeing that the contract with Messrs. Martyn, Dennis, and Co., of Liverpool, had not yet expired.

The CHAIRMAN said the matter was very easily explained. They were bound by their contract to supply the Liverpool firm with No. 1 quality arsenic, whilst that which was sold to Capt. Brown was mixed up with "chirks." This second quality came from Hodge's flue.

Capt. JAMES wished it to be understood that he did not ask the question simply for his own information, but in order to put a stop to unnecessary and undesirable discussion elsewhere. Was it specified in the contract with Messrs. Martyn, Dennis, and Co. that they should have refined arsenic from a particular chamber or a certain stack?——The CHAIRMAN believed there was a distinct understanding that they were not to be supplied with any arsenic that was mixed with cinders.

The PURSER added that the sale was effected according to sample. The adventurers might rely upon it that the committee, who were the largest shareholders in the mine, would sell in the highest market, and they could only do this by inviting the largest amount of competition.

Capt. JAMES said the explanation was perfectly satisfactory to him, and

The CHAIRMAN thanked Capt. James for having brought the subject forward. There was nothing so objectionable as that people should come to the meeting and say nothing, and then go away and complain elsewhere.

Capt. HOSKING, in answer to a question from Mr. RULE, said that they were at present paying 18s. a ton for their coals. They obtained them from the Portreath Company, and the coals were very good.

Mr. RULE suggested that they might effect a great saving if they imported their own coals.

The PURSER replied that they might do that in every department of the mine, and, no doubt, effect a saving by it, but as miners he did not think it was their province to undertake such a duty, involving, as it would do, an immense amount of capital. (Hear, hear.)

The report and accounts were adopted, and the meeting separated after a few words of congratulation from the Chairman on the present position of the mine, and the expression of a hope that at the next meeting a dividend would be paid.

The PURSER, however, humourously called the Chairman to order, as he was treading on rather delicate ground.

DRAKE WALLS TIN AND COPPER MINING COMPANY.

A general meeting of adventurers was held at the offices of Mr. T. Currie Gregory, St. Vincent-street, Glasgow, on May 5, Mr. G. STEWART ANDERSON in the chair.

The committee state that the revenue account shows a small profit, whilst the construction account shows a continued increase. Your committee have been greatly concerned at this, but the expense has been found indispensible to bring the mine into a thorough working order, so that the 80 heads of stamps might be fully supplied with tinstuff, and the black tin returned at the most economical rate. The balance sheet shows a deficiency of 4616*l.* 0s. 5d., as at Dec. 19, 1874, but your committee think it right to inform you that the deficiency up to the end of March, which is as close as can be calculated, is about 7000*l.* It will be observed, however, from the agent's report that there is upwards of 3000*l.* worth of tin ore broken underground, which has been paid for, and which will in due time come to market. It is satisfactory to know that the mine has fully come up to expectations, and that if the price of tin had not fallen, we should have got from our past sales 5538*l.* 9s. 3d. more, and now be netting a clear profit of nearly 600*l.* per month. Your committee have carefully considered whether the mine can be worked henceforth without loss at the present price of tin, and they believe that it can. At the last meeting it was hoped that the overdraft authorised would be met out of increased sales of tin, but this has not been the case, as the new stamps have only recently been set to work. This, together with the further fall in the price of tin, leads your committee to advise the making a call of 1*l.* per share, which will relieve the finances of the company. Any improvement in the average quality of the stuff supplied to the stamps, or any rise in the price of tin, which may be reasonably expected with the revival of trade, would soon place the company in a good position.

Capts. Skewis and Dunstan says—Hitherto large quantities of timber have been required for putting shafts and levels in working condition, and also to secure the ground; further, we have had to put in very extensive and costly stulls so as to work the lodes, and on them we estimate we have accumulated from 5000 to 6000 tons of tinstuff, which we calculate will yield from 50 to 60 tons of black tin. The greater part of the cost of breaking which has been paid. This stuff cannot be taken away for some considerable time to come; in fact, it must continue to increase, as the men must keep a certain part of what they break under their feet in order to be in a working position until they are sufficiently high to put in another stull, when the stuff on the present ones will be taken away. You will at once see the wisdom of having as few as possible of these stulls, in order to save the cost in timber. Having regard to present low price of tin, we have decided to make a reduction of about 20 miners, thereby reducing the cost without affecting the returns. Since the last meeting a level has been driven under the stamps floors to the shaft sunk in front of the fly-wheel loading, into which a new 13-in. lift is placed, and plunger-pole fixed in order to return the water for dressing purposes when required during dry weather. This has cost a good bit of money, but could not possibly be done without. We have put a water-wheel to drive all the buddles in front of stamps, so that dressing operations will be carried on regularly, while stamps at any time may be idle for repairs. The new calciner has been fixed and set to work, and a new buddle in front to receive the tinstuff from it. It was only on Feb. 3 that the new 24 heads of stamps were set to work, but for various reasons we have not been able to keep them fully employed on underground stuff till now, but have had to supply them with about 500 tons per month of Burrow stuff. Owing to this, the output in the four months included in the accounts has been only about 16½ tons per month. We are now keeping the 80 heads going full time on underground stuff, and expect to dress henceforth about 20 tons per month. The limitation of this is the number of stamps and winding-power, and not the condition of the mine, which has come fully up to our expectations; and, if the price of tin had remained where it was when we started, we should have been earning about 1685*l.* per month at a cost of 1100*l.*, making a profit of 585*l.* per month, instead of only paying our way, as we expect to do until a further advance in the price of the metal.

A call of 1*l.* per share was made; and Messrs. G. Stewart Anderson, R. S. Cunliffe, John Bell, George Lamb, H. Herbertson, and T. Currie Gregory were elected the committee.

SOUTH ROSKEAR TIN AND COPPER MINING COMPANY.

A general meeting of adventurers was held at the offices of Mr. T. Currie Gregory, St. Vincent-street, Glasgow, on May 5, Mr. G. STEWART ANDERSON in the chair.

The accounts, from Sept. 5 to Dec. 25, 1874, showed a debit of 2715*l.* 14s. 1d.

The committee state that no sales of tin have gone to credit. This has been owing to the very serious floods of last winter, which drowned several mines in West Cornwall for a length of time, interfering with the pumping of Pendarves sett, and the setting of Dunkin's shaft free for hauling the stuff through for the stamps. The stamps have recently resumed work, and within the last few weeks upwards of 800*l.* worth of tin, copper, and arsenic have been got ready to be sold next week. These difficulties are now overcome, and regular sales will be made. Your committee would call your attention to the important discovery of copper ore at the 80, at Vivian's shaft, and to the expected discoveries at the elvan in depth at Gregory's shaft. This mine was once a very rich copper mine, and there are good hopes of its being so again. The most important feature, however, is the great rise in the price of arsenic within the last six months, fully 50 per cent., which is largely intermixed with the tin ore, and which will form a very large item in the revenue of the company. Kilns have been erected, and are at work roasting the ore to drive off the arsenic, and calcine the stone. The arsenic is caught in the form of soot in the flues, of which during the last few weeks since the kilns commenced to work over 200*l.* worth have been taken out, and the cinder is sent to stamps. From its friability the effective work of the 40 heads of stamps is much increased, and a great economy is being effected in the dressing department. Your committee regret that from the difficulties incident to the draining of an old mine the expenses have been much greater than was anticipated; but taking into consideration the three sources of revenue—tin, copper, and arsenic—they have reason to believe that the mine is on the eve of success.

Capts. W. Skewis, J. Brentin, and J. Hosking say—We have, however, sent to the surface (as per the tin dresser's assay) 10 tons 3 qrs. of black tin, at (say) 52*l.* per ton, equal 527*l.*: 27 tons of copper ore, at (say) about 3*l.* per ton, equal 81*l.*; 27 tons 13 cwts. 2 qrs. of arsenic (which has been weighed), at (say) about 8*l.* per ton, equal 221*l.* 2s. 10d., making 829*l.* 18s. 10d., and we hope with a vigorous working, both at surface and underground, to meet the expenditure at no distant date.

A call of 10s. per share was made; and Messrs. J. Carmichael, R. H. Leadbetter, William Ewing, G. Stewart Anderson, and T. Currie Gregory were elected the committee. Mr. Nathaniel Spens was appointed to audit the accounts, and report to the next general meeting.

RICHMOND CONSOLIDATED MINING COMPANY.

The report to be submitted at the forthcoming meeting states that the total number of tons of Richmond ore smelted during the half-year amounts to 17,929 tons, and of purchased ore to 389 tons, together producing 3198 tons of base bullion and 10 silver bars, of the aggregate value of 222,504*l.* The net revenue for the half-year amounts to 80,309*l.*; the net revenue for the year ending August 31, 1874, amounted to 86,591*l.* The working expenses for the half-year are at the rate of 66¼ per cent. on the gross bullion returns, and for the year ending August 31, 1874, 77 per cent. The profit per ton of ore smelted during the six months was $20, and for the year ending August 31, 1874, $13. The average yield per ton of ore for the six months was $60·73, and for the year ending August 31, 1874, $58·98. This satisfactory result is due to several causes, principally to the improvements introduced by Mr. Probert, the increasing value of the ore as the mine developes, and the continuous running of the furnaces during the half-year. This is the more satisfactory as the economies expected to be effected by the erection of the refining works do not, in consequence of the delays in delivering the apparatus, come into the present accounts.

During the half-year 10,632*l.* has been expended upon the refining works, sinking the Richmond shaft, purchase of land, erecting buildings and machinery, and other items coming under the head of "Expenditure on Capital Account;" this amount has been provided out of revenue, so that the capital at the present date stands at the original amount of 270,000*l.* After deducting the two dividends paid in the half-year, amounting together to 26,998*l.*, there remains out of the net revenue of the half-year a balance of 42,678*l.*, which, with 5135*l.* brought forward from the last account, makes a total of 47,814*l.* standing to the credit of the revenue account on Feb. 28. Of this sum the directors have set aside 25,000*l.* towards the creation of a reserve fund for contingencies and working capital. The whole of the capital —270,000*l.*—having been expended in the purchase and defence of the company's property, and a working capital being essential to the proper carrying on of the company's business, the directors think that the time has arrived for this step to be taken. Out of the balance—22,814*l.*—they propose to declare in the present month a dividend of 7s. 6d. per share, which will absorb 20,250*l.*, leaving a balance of 2564*l.* to carry forward.

PESTARENA UNITED GOLD MINING COMPANY,

The report to be submitted at the forthcoming meeting states that at the Val Toppa Mine all the underground operations have been exploratory. The managers report that they have satisfied themselves as to the practicability of a system of fixed wire cables for the transport of the ore from the mine, but the directors have not had sufficient funds to provide for the cost of the construction of this road simultaneously with the outlay on the new works at Pestarena. Under these circumstances no ore has been raised from this mine during the past year. The reserves, therefore, remain as before, about 33,000 tons. The new machinery erected for the treatment of the ores from this mine was got into operation soon after the last meeting, and was employed in the reduction of a portion of the ores which were then in stock. The results obtained were good, but it is proposed to make the arrangement more perfect by some modifications and additions: 1598 10 per cent. preference shares remaining unissued, the directors, in order to provide the money necessary to complete the extraordinary works recommended in their report of Feb. 13, 1872—the cost of which has been increased by the great advance in the cost of materials and labour—have opened a negociation for a loan on mortgage of the company's property, and although at one time they had great reason to expect the satisfactory completion of the business with some Italian capitalists, the occurrence of certain financial tronbles in the commercial towns of Northern Italy interrupted the treaty. Mr. Franzi, the commercial and financial agent of the company at Pallanza who conducts these negociations, values the machinery, plant, &c., at about 34,150*l.* This does not include the value of the mines themselves, or of several royal concessions of the important water rights. During these negociations Mr. Franzi has provided funds for the payment of the mines cost, drawing on the company for the amount of the advances required for each month. Bills amounting to 7350*l.* have been so drawn. It is estimated that a further expenditure of about 5000*l.* or 6000*l.* will complete the shaft to the 80, and the erection of machinery and reduction works, after which the extraction of rich ore from the deepest levels of these mines may be commenced, from the treatment of which good profits may be anticipated.

The amount of the loan—15,000*l.*—for which the directors are in treaty, will be sufficient to discharge all the company's liabilities, and to provide amply for the completion of all the new works.

WHEAL OWLES.—At a meeting of adventurers, held at the mine on May 7, the accounts showed a debit balance of 13,372*l.* 17s. 9d. A call of 10*l.* per share was made. The transfer of a portion of the Truthwall sett to Botallack adventurers for 300*l.*, which also includes the final settlement of the encroachment made unwittingly by Wheal Owles into Botallack, negociated by the committee appointed at the last meeting, was confirmed. Work performed during the quarter—120 fms. 5 ft. 3 in. driven in levels, and 17 fms. 4 ft. 6 in. sunk in shafts and winzes; 20 pares stoping for tin on tutwork, and 24 pitches working on tribute. They have about 200 tons of tin unsold.

'For remainder of Meetings see to-day's Journal.]

CORNISH CONSOLIDATED IRON MINES CORPORATION.

This was a petition for a compulsory order to wind up the above company. The petitioners were the Cornwall Minerals Railway Company, who were creditors of the Corporation for 5331*l.*, a debt incurred for carrying ore over the railway. The Mines Corporation was formed in 1872 for the purpose of working certain mines in Cornwall. Their capital was to be 600,000*l.*, divided into 30,000 shares of 20*l.* each. The number of shareholders amounted to 42, holding about 20,600 shares. They were unable to proceed with the undertaking for want of capital, although it was stated that the mines were considered to be very valuable. The petition was supported by about two-thirds of the shareholders and by all the creditors of the company except one, a Mr. Lafone, who was a creditor under an award for 4000*l.*

Mr. Higgins, Q.C., and Mr. Dunning, in support of the petition, contended that they had a right to the winding-up order, since they were large creditors, and the company were unable to pay them.

Mr. Glasse, Q.C., Mr. Renshawe, and Mr. French opposed on behalf of Mr. Lafone, and contended that the petition was got up by collusion among the parties in order to prevent him from obtaining the debt due to him.

Mr. Robinson appeared for the company, Mr. Whitehorne for about half the shareholders, Mr. Graham Hastings, Mr. Homer, Mr. Cookson, and Mr. Humphreys for other shareholders and creditors, all of whom supported the petition.

Mr. Ingle Joyce appeared for the Sheriff of Cornwall.

Vice-Chancellor Sir R. MALINS said this petition was supported by the great body of the shareholders, and by all the creditors but one, among whom were two of the principal bankers of London who were judgment creditors for a large amount. Mr. Lafone, the single creditor who opposed the order, had a contract with the company, under which he alleged that they were liable to pay him a considerable sum of money. As a person having only a contract he had no *locus standi* for the purpose of opposing the order, for otherwise every contractor might appear who thought he should lose anything by the winding-up; but he was also a creditor for 4000*l.*, and in that character he set himself in opposition to all the other persons who supported the petition. Having, then, a right to appear he had instructed his counsel to accuse every person connected with the company—all the shareholders, all the creditors, and all the solicitors—with a conspiracy and collusion to deprive him of his rights. He was sorry to find that such a charge had been made, which there was nothing to substantiate. He had at first thought that it might be better to have delayed the winding-up until a report could be obtained from the provisional liquidator as to the prospects of the company, but from the angry feelings exhibited by the parties this would be a useless course, and, considering the overwhelming number of shareholders and creditors he could not refrain from making the usual compulsory order to wind-up the company.

THE TECOMA SILVER MINING COMPANY.

These were two petitions to wind-up this company, which was formed in January 1870, with a capital of 300,000*l.* for the purpose of acquiring a mining property in Box Elder county, in the Territory of Utah, in the United States of America, and known as the Stanley, Lumsden, Orbit, and Gladstone claims; the consideration for the purchase being 280,000*l.*, 150,000*l.* in fully paid-up shares, and 130,000*l.* partly in cash and partly in fully paid-up shares. The petitioners were both former officers of the company in Utah, one their manager and the other their book-keeper and accountant, and they petitioned for the winding-up of the company as creditors for arrears of salary and other moneys. In each case the company disputed, but as the petitioners alleged without cause, the amount of the petitioning creditors' debt, and set up counter claims against them.

Mr. Dickson, Q.C., and Mr. Dawney appeared for the petitioner in the first petition; Mr. Karslake, Q.C., and Mr. Soloman for the petitioner in the second petition; Mr. Lindley, Q.C., and Mr. Alexander for a creditor; Mr. Greene, Q.C., and Mr. Grosvenor Woods for the company; and Mr. Nalder for shareholders.

Vice-Chancellor Sir C. HALL considering that the debt of the petitioning creditor in each case was disputed, would not make a winding-up order on either petition, but upon the company agreeing to pay each creditor 100*l.* on account, and without prejudice, and to pay into Court the balance due in regard of their respective salaries, his Honour ordered the petitions to stand over, so that actions at law might be brought by the petitioners against the company.

THE FLAGSTAFF SILVER MINING COMPANY OF UTAH.

This was a petition to wind-up another company formed to work mines in Utah. Capt. Forbes, the petitioning creditor, had obtained judgement against the company but had not issued execution, because the company's solicitor had told him there was no property of the company on which he could levy, and the company having since paid the petitioner's debts, objected to paying his costs of the petition, on the ground that under the 80th section of the Act of 1862 the company could not be considered as unable to pay its debts (which was the ground of this petition), unless the judgement creditor petitioning had actually levied and failed to find assets.

Vice-Chancellor Sir C. HALL, however, held that when the judgement creditor was told by the company that they had no assets on which he could levy, that was evidence of their inability to pay, so as to relieve the judgment creditor from the necessity of actually levying; but, as in this case, the company had since the petition was presented paid the petitioner's debt, his Honour made no order except that the company should pay the costs of the petition.

Mr. Lindley, Q.C., and Mr. Graham Hastings appeared for the petitioner; Mr. Greene and Mr. Grosvenor Woods for the company.

MINING IN AUSTRALASIA—MONTHLY SUMMARY.

THE WALLAROO.—On this great and valuable property operations are being vigorously pursued, and the mine would seem to be what miners would term "holding its own." On the main lode there is the deepest shaft on the Peninsula—about 150 fms. down, we believe—and the lode presents precisely the same features as it did when the shaft was but a few fathoms from the surface.

THE DEVON CONSOLS.—This mine, if properly developed, will be one of the most valuable properties on the Peninsula. At the older workings, which are down to the 85, the engine is doing good work, and not much less than 800 tons of ore have been raised and dispatched since the lode was first cut. Recently the men have been employed cutting a plat, which has rather retarded other operations, but now both sinking and driving will be the order of the day. If the lode should continue to be as rich as it now appears it is probable that the ore raised may be of sufficient value to pay the cost of erecting a second engine; but whether this be so or not, the company has a property that bids fair to be second in value to very few on the Peninsula. A judicious expenditure of capital may be found desirable; but the mine is one that a Cornishman would stick to at any risk.

THE MOONTA MINE.—The report for the half-year ending March 20 shows that the quantity of ore raised during the period has been 9554 tons of ore, yielding 23 per cent. of fine copper, and 1250 tons of slimes of 7½ per cent., making a total of 10,804 tons. This, with the 2914 tons that were on hand, makes an aggregate of 13,718 tons available for disposal during the six months just closed. Of this 10,766 tons have been sold to the Wallaroo Company under terms of an agreement entered into with that proprietary some time ago. The sale of this has realised the large sum of 136,475*l.* 13s. 5d., against which must be placed the working expenses, which amount to 86,588*l.* 2s. 11d., thus showing a net profit of close upon 50,000*l.*, apart from the value of the 2952 tons of ore still unsold, which is estimated to return 38,376*l.* The total assets of the company, including the buildings, machinery, &c., are set down at 204,950*l.* 13s. 6d., and on the other side there are liabilities amounting to 38,852*l.* 15s. 3d., leaving the handsome sum of 166,097*l.* 18s. 3d. now standing to the credit of profit and loss. Of this, however, 132,703*l.* 9s. 2d. is locked up in plant, buildings, &c., so that the whole amount actually available for distribution among the shareholders is 33,395*l.* 9s. 1d. From this it is proposed to pay a dividend at the rate of 10s. per share, which will absorb 16,000*l.* The balance will probably be kept as a reserve to meet the fine which it is understood will shortly be imposed by the Government for renewing the leases. From Capt. Hancock's report as to the state of the various workings we note that 26 shafts have been kept in active operation, and that the production has varied from 1 ton to 7 tons per fathom, the richness of the ore varying from 14 to 50 per cent. of fine copper. The Prince Alfred shaft is spoken of as the "most productive and profitable part of the mines" two lodes turning out respectively 6 tons of 26 and 28 per cent. ore per fathom. At Young's shaft "a few piles of ore have been broken, exceedingly rich, some 50 per cent.:" but the general average, as already stated, is 22 per cent. of pure copper. "The company's establishment consists of 18 officers, 886 miners, 70 mechanics, 250 labourers, and 254 boys at the mine, and three officers at Adelaide, making a total of 1461 persons now in the company's employ." The various machinery and appliances are reported to be in satisfactory working order, and the whole prospects of the mine are most encouraging.

THE LADY ALICE.—The manager reports that during the past fortnight 212 tons of stone have been crushed, yielding 95 ozs. of smelted gold. At the 50 ft. level, south of the shaft, the slope has been carried a distance of 26 ft. further south. The rise at the back of the same level has been carried up 21 feet, the lode carrying very good copper and gold throughout. At the 100 feet level a distance of 17 ft. 6 in. has been driven, making a total of 95 ft. from the cross-cut; the lode broken up, but carrying a little gold throughout. On the south end, at the same level, the drive has been carried a further distance of 7 ft. 6 in., making a total of 66 ft. from the cross-cut. The contractors have sunk the engine-shaft a further depth of 5 ft., making a total of 19 ft. from plat, without any change of country. Five or six tons of copper ore will be sent in shortly. The manager commenced on Wednesday to dress a large pile of copper ore from the tailings of the battery, which is expected to yield from 15 to 16 tons of clean ore. At the meeting of the company, on Wednesday, a tender by Hooker and Co., for new boiler, was accepted, and arrangements were made for calling for tenders for stampers.

GORGEOUS WATCH CHAIN.—Messrs. Denis and Co., of Melbourne, have manufactured for a miner a diamond and gold watch-chain of extraordinary splendour. The diamonds are in double rows in each link, and are set in open gold work called the Queen's scroll. The cost of this specimen of jewellers' ware is 1000*l.*

UNTOLD GOLD IN AUSTRALIA.—A miner named Goodwin was convicted in February of stealing 250 oz. of gold from a mine at Ballarat where he had been working, and that from what transpired at the trial, and from his confession since, it is to be feared that the dishonesty of the working miners, in not handing the gold they find to their employers, is such that to it may be attributed much of the result where gold mining is unprofitable.

A light on the catadioptric principle has been fixed at the Glenelg Jetty.

The harvest is now over. From information gathered from correspondents in various parts of the colony, the *Register* estimates that the land under cultivation was 805,000 acres, being an increase of 80,000 acres on the preceeding year; and that the gross yield will will be 10,870,000 bushels of wheat, or a trifle 12½ bushels per acre. After deducting a fair allowance for home consumption and seed purposes, this will leave 8,170,000 bushels, or 204,000 tons, for sale or shipment. Wheat is now worth 4s. 1d. per bushel, and flour 9*l.* 12s. 6d. to 10*l.* 10s. for country and town brands respectively. It is said that 500,000 bushels of grain are awaiting shipment at Port Pirie—*South Australian Register*, April 27.

AUSTRALIAN MINES.

PORT PHILLIP AND COLONIAL (Gold).—March 23: Quantity of quartz crushed for the four weeks ending Feb. 24 was 2988 tons; pyrites treated, 12 tons; total gold obtained, 681 ozs. 13 dwts., or an average per ton of 4 dwts. 13¼ grs. Receipts, 2713*l.* 0s. 11d.; payments (including 711*l.* 2s. 1d. paid for firewood and mine timber), 3109*l.* 14s. 5d.: debit balance, 396*l.* 13s. 6d., from which was deducted last month's credit balance of 140*l.* 17s. 7d., leaving a debit balance of 255*l.* 15s. 11d., which was carried over to next month's accounts.

SCOTTISH AUSTRALIAN.—The directors have received advices from Sydney, March 20, with reports from Lambton Colliery to March 15. The sales of coal for February amounted to 12,586 tons.

ANGLO-AUSTRALIAN.—Mr. S. H. Clark, Fryerstown, March 24: Capt. Raisbeck has been very busy since your letter came to hand, through the great influx of water; but now that it is nearly beaten I shall have more time with him, and will write fully next month. The directors may, however, rest satisfied that the funds will be as "judiciously and economically expended" as it is possible for us in the exercise of our best judgment to do. Capt. Raisbeck writes, March 23:—"I have the honour to report progress since the 23rd ultimo.—Cross-cut 320 ft. Level: We have extended this drive 32 ft. On the 13th inst. we cut two leaders of quartz, and sufficient water to beat the engine. At 9 o'clock P.M. I had to get men to puddle the water in 40 ft. from the shaft. The water was rising in the shaft at the time 12 in. per hour. It has now decreased a little, but are still obliged to keep pumping day and night. I have examined the Perrons Gold Mining Company's underground workings, and find this level, when far enough east, must intersect their blocks of stone, except something unaccountable takes place. This drive is now 120 ft. from the shaft. I did not see any gold in the leaders, having such a rush of water that it brought quartz and mullock down together. We have not yet finished securing the level, but will in two days.—Cross-cut 200 ft. Level: The contractors finished their work on the 16th inst. They have since driven 8 ft.; distance from shaft 213 ft. I expect a change in this drive during next week.

AUSTRALIAN CENTRAL.—Mr. Gill, Fryerstown, March 24: The repairs to the shaft are completed; is is now in first-class order, and (with the exception of its size) all that could be desired. The underground levels are all cleared, and re-timbered in places, and ventilation perfect. A main reef level, heading north 5° E., has been commenced. At the time of the contract being taken it was driven 50 ft. on wages. The contract is for 350 ft., at 11s. per foot, the men finding their own candles, powder, &c. In order to secure current wages, the contractors will have to complete contract in three months. Capt. Anguin, March 20, writes:—"On Feb. 10, I started, with four men, to newly centre the shaft, and to enlarge it; completed same on March 9. It was a difficult job to perform, but I have no hesitation in saying it is now one of the best in the district, and calculated to last for many years. Of course it has taken time and money to repair, but far less ex-

pensive than sinking a new shaft. I put on six men, after completion of shaft, to clean out bottom levels, to ventilate the mine, and to enable us to block a piece of ground near the eastern 'jump-up,' which I have no doubt will give a small profit to the company. On March 17 I let a contract, to extend bottom level 350 ft. to enable us to work the deep rich ground. I have no doubt, when this is completed and the mine opened up, it will become one of the best paying mines in the colony. I should think, from present appearances, it will take about four months to get in thorough working order on the payable wash; the only thing wanting is sufficient capital to enable us to do so. Machinery is in good working order, and everything going on well."

ENGLISH AND AUSTRALIAN (Copper).—The directors have advices from their manager, dated Port Adelaide, March 27. The quantity of coal on hand and afloat was 2596 tons. All the furnaces, both at Port Adelaide and Newcastle, were in full work. The shipments of copper since the date of last advices have been 2383½ tons.

YORKE PENINSULA.—The directors have advices from the committee of inspection of the company at Adelaide, dated March 27, with reports from the Kurilla Mine to the 25th. Capt. Anthony reports:—"Grainger's engine-shaft is out down to the 15, the bearers and frames put in, and, all well, will be divided, cased, and laddered to that depth by the end of March." Of the new hauling shaft being sunk at a point 60 fathoms east of Hall's, he reports: "I am now daily expecting to hole to the 15, when I shall at once begin to cut a plat. This done, it is my intention to sink away to the 25 without delay. The 15 is now driven 2 fathoms east of the new hauling shaft." . . . . "Since my last report the lode in the 25, east of Hall's, has been very changeable, but the improvement is gradual and solid, the present yield of ore is equal to 1½ ton of 15 per cent. ore per fathom. I have not yet cut into the south side in search of the best part of the lode in the 15, as I want to get the drive as far east as possible, with the object of draining the lode before sinking the hauling-shaft below the 15 fm. level." . . . . "Three tributers are working in the back of the 25 east at 9s. in £. They raised for January and February take nearly 20 tons of good ore, and are again doing well at 10 per cent. less share of the ore." . . . . "The cross-cut north in the 25, west of Deeble's, has intersected a vein of about 6 in. wide, of copper ore and iron pyrites." With respect to the new lode he writes: "The 10 is driven east of No. 1 trial pit about 12½ fathoms, or within 2½ fathoms of the eastern boundary line. I have discontinued driving, as the Devon Consols people have now cut ore on this lode about 5 fathoms east of the boundary line, and will be sinking a shaft on it, thereby testing the lode at greater depth. The lode in our 10 east is 1 ft. wide of paying ore, but not rich." . . . "I have to-day commenced a small shaft east of No. 1 trial pit, to come down on the best of the ore, to serve as a ventilator and a pass, through which to fill the excavation made by stoping the lode. I hope to pay all the cost incurred by ore from the 10 fm. level. . . . . I beg to confirm what I said on the 15th inst., that the mine is opening out most satisfactorily, considering the short time we have been at work. I have about 100 tons of ore on hand, which I have to day begun to dress. As you are aware, this ore, except about 20 tons of tributers', has come from the shafts and the levels, as no stoping is yet resorted to. After cutting the plat in the 15 fathom level, east of Hall's, I shall begin to raise a considerable quantity of ore." . . . . "When it was determined to sink Grainger's engine-shaft to attack the lode below the 25, west of Deeble's shaft, our object was clearly defined. Now we have two fresh objects of more immediate (as far as an early return of ore is concerned) importance—the ground east of Hall's and the new lode, to say nothing of what may grow out of the three other ore branches intersected by the cross-cut north of Trial shaft A. . . . Work that must not now be delayed long under any circumstances is to drain Hall's engine-shaft to the 35, and drive at that depth east to intersect the ore now seen in the 15 and 35. If successful in this, drain Hall's to the 45, and drive at that depth east to intersect the ore, and also west towards Deeble's and Grainger's shafts to prove the lode in that direction, and also to complete Grainger's shaft to the 25, by which time the ground east of Hall's will be laid open for stoping away the ore from the 35 upwards, and a correct opinion be obtainable of the future prospects of the mine."

THE MINERAL RESOURCES OF THE SOUTH-WEST OF IRELAND—No. IV.

[FROM OUR SPECIAL CORRESPONDENT.]

SCHULL DISTRICT.—The neat little town of Schull is pleasantly situated at the base and south side of Mount Gabriel, and close to Schull Harbour; it is well sheltered from cold north winds, and admirably situated for sea bathing. There are good shops, hotels, &c., a safe harbour, sheltered from all winds, with a good quay, alongside which vessels can discharge and take in cargoes. To the west of Schull, in Lemcon Manor, several copper lodes were discovered by surface shallow trials; and at Lowertown, in one of the pits, very rich specimens of copper ore and carbonate of copper were found, and as nine lodes and veins have been found running through this property, it is more than likely that great deposits of ore will be found with a small outlay of capital. At a short distance west from Clough Harbour the ground rises to a height of 350 ft.; this hill contains a bed of roofing slate, 20 yards wide, which may be shipped from a slip near the quarry. Looking to the east from Schull, across the harbour, is Coosheen Mine, which, with its neat and substantial white-washed buildings, has the appearance of a prettily-situated village. This mine, with all the surface works, quays, yards, &c., was laid out and managed by Capt. W. Thomas some 35 years ago, who raised and sold copper ore to the value of 20,000*l.*; and had not the then proprietors insisted on the operations being carried out on the principle of "killing the goose that laid the golden eggs," this mine would, no doubt, have been a profitable concern to this day. The copper yards and dressing floors are situated near the quay, at which vessels can load and discharge cargoes. The machinery for crushing the ore was worked by water-power, there being large reservoirs and extensive water-courses, which give a supply sufficient for breaking and crushing from 8000 to 10,000 tons in the year—or, in fact, any quantity of ore stuff which might accumulate in summer would be crushed during the winter. A pumping-engine has been erected on the top of the hill, and the engine-shaft sunk 36 fms. below the adit level. There are six parallel lodes in this mine, which were partially opened by Capt. Thomas, and all of them found to be productive; these lodes are within a distance of 150 or 200 fms., and are a continuation of the great zone or belt of lodes traversing the district from East Cappagh to Brow Head. Cargoes of ore from this mine have been sold in Swansea at 38*l.* per ton, and splendid masses of malachite were found in Thomas's lode during the early workings. There are three or four important points in this mine which when laid open would, I am confident, place it again in the dividend-paying list, no great outlay or length of time being required. The lodes, however, being intersected by slides and cross-courses, the workings require to be carefully dialled, as will be shown by an extract from Mr. George Henwood's "Mem's of Miners," published many years ago in the *Mining Journal*:—

"Capt. W. Thomas (Ireland), after receiving a liberal education, was brought up in Dolcoath Mine, in which he had the very great advantage of being taught dialling and the whole routine of the profession by the most eminent miners of the day, as well as assaying copper, tin, lead, &c. In Dolcoath he worked for several years as a tributer, an admirable practical school; his first appointment as agent dates as far back as the British United Mining Company, since which he has been employed in examining mining properties in different counties in England and Wales. Upwards of 30 years' experience in Ireland constitutes him one of the best authorities of that county's capabilities, which meed we believe is universally awarded to him. Coosheen Mine affords an example, as when he assured the management the main lode had been lost by a slide or fault heaving it. By his scientific skill and practice he was enabled to form an opinion which way the fault had thrown the lode. After driving a cross-cut 16 fms., at a cost of 30*l.*, he discovered the lode as he had anticipated, containing a splendid course of ore of the rare variety for Great Britain, termed malachite, many as large as 40 lbs. in a stone. Many thousands of pounds worth of copper ore were raised and sold here in a short time."

I have no doubt of being able to place this mine in the dividend-paying list.

VENTILATING UNDERGROUND RAILWAYS.—Mr. A. CHAMBERS, of Marylebone-road, signal engineer, has patented an invention which has for its object improvements in ventilating underground railways. With the airways are combined diaphragms or partitions provided with guides or deflectors, arranged to arrest the passage of foul air, gas, or vapour, to deflect and guide such foul air, gas, and vapour into and cause its escape by the airways, and to promote the descent of fresh air for ventilation. By this plan a passing train will cause foul air, gas, and vapour to pass up the airway at one side of the diaphragm or partition, and currents of fresh air to descend the airway at the opposite side of the diaphragm or partition as the train proceeds. A similar effect will be produced by wind blowing into the end of the tunnel or covered railway. To ensure the deflection of the currents of foul air, gas, and vapour at the required points, deflectors or baffles are provided at or near the airways or openings, or at the extremities of the tunnels or covered portions of the railways, such deflectors or baffles being arranged to reduce the cross sectional area of the train passage way as far as possible, consistently with the safe and uninterrupted passage of trains.

BRICKS AND TILES.—Mr. J. WHITTAKER, engineer, of Accrington, has patented an invention which relates to a special construction and arrangement of machinery or apparatus for making compressed bricks, tiles, or other similar articles from granulated or pulverised clay, the machinery being arranged both single and double, so as to make one, two, or more bricks, tiles, or other articles, during one revolution of the principal or main shaft of the machine.

EPPS'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*

Registration of New Companies.

The following joint-stock companies have been duly registered:—

WEST PRUSSIAN MINING COMPANY (Limited).—Capital 210,000*l.*, in 10*l.* shares. To acquire the properties of the Westphalia Silver Lead and Copper Mining Company (Limited), and the Heidberg Silver Lead Mining Company (Limited), according to an agreement made with the liquidators of those companies, and to acquire and work adjacent mines, or any mineral properties in Prussia. The subscribers (who take one share each) are—C. Wynne, South-hill, Sydenham, retired colonel; A. W. F. A. Wynne, Westwood Cottage, Sydenham, civil engineer; F. Wynne, Westminster Chambers, civil engineer; J. Proffitt, Heathcote-street, solicitor; F. B. Dering, Westminster Chambers, civil engineer; J. B. Batten, Great George-street, attorney; and J. W. Batten, 3, Harcourt Buildings, Temple. The directors are—Messrs. B. Nixon, J. R. Stewart, A. A. Wynne, and Col. Wynne, the qualification being 50 shares, and the remuneration 100*l.* per annum for each director.

WEST PRINCE PATRICK AND OLD SILVER RAKE SILVER-LEAD MINING COMPANY (Limited).—Capital 20,000*l.* in 2*l.* shares. To acquire the leases of the West Prince Patrick and Old Silver Rake Silver-Lead Mines. The subscribers (who take one share each) are—R. M. S. Annesley, Blandford Lodge, Chiswick, Lieut.-Colonel; C. Wollaston, 65, Westbourne Park-road; B. G. A. Bilson, Augustus-road, Ramsgate, Commander R.N.; H. Coglan, Mansion House Chambers, late Captain of Hussars; Mowatt F. Hunt, Duke-street, S.W., secretary; B. J. Cunninghame, Clapham-road, clerk; W. Jarvis, Chancery-lane; J. Rowland, 5, Upper Grafton-street; W. and J. Roland, 5, Upper Grafton-street. The directors are—Lieut.-Colonel Annesley, J. R. Jones, Esq., Capt. B. G. Bilson, C. J. Wollaston, Esq., Colonel R. M. Bonnor, Rev. D. Jones, and H. Coghlan, Esq., the qualifications being 25 shares, and the remuneration 100*l.* per annum each.

LONDON CHARCOAL IRON COMPANY (Limited).—Capital 21,000*l.*, in 10*l.* shares. To utilise scrap-iron, tin scraps, and cuttings, and to take over the business of Mr. F. G. Morton, engineer, and of 16, Lynton-street, Bermondsey. The subscribers (who take one share each) are—F. G. Morton, Lynton-street, Bermondsey, engineer; E. Newman, jun., 16, Albert Mansions, Victoria-street; W. E. Bovill, 20, Queen-street, Westminster, law student; C. O. Newman, Lincoln's Inn Fields, solicitor; E. C. Bovill, Old Buildings, Lincoln's Inn, barrister; Alfred Bovill, Cockspur-street, architect; A. Woods, Upper Bennerton-street, N., solicitor's clerk; M. A. S. Brott, Albert Mansions, governess. After the incorporation of the company a contract is to be made whereby 1861 shares will be allotted to the founders. Mr. Morton is to be the managing director, at a salary of 400*l.* per annum.

HENRY AND EDWARD N. LEVY AND COMPANY (Limited).—Capital 200,000*l.*, in 100*l.* shares. To acquire the business of Messrs. H. and E. N. Levy and D. S. Barclay, of Mark-lane and elsewhere, jute, flax, and hemp merchants. The subscribers are—H. Levy, Mark-lane, 442 shares; E. N. Mark-lane, 441; W. Goulding, Cork, 137; D. L. Barclay, Mark-lane, 117; Alfred Howard, Maida Vale, 215; B. Moss, Keppel-street, 143; and H. M. Goulding, Cork, 81 shares.

AUTOMATIC BLOCK SIGNAL COMPANY (Limited).—Capital 25,000*l.* in 1*l.* shares. To acquire the patent rights of E. Entwistle in an invention for improved railway signals. The subscribers reside at Blackburn.

ASHTON, FROST, AND COMPANY (Limited).—Capital 30,000*l.*, in 5*l.* shares. To acquire an engineer's business at Blackburn.

YARMOUTH AQUARIUM SOCIETY (Limited).—Capital 100,000*l.*, in 5*l.* shares. To construct an aquarium and winter gardens, &c., at Great Yarmouth. The subscribers (who take one share each) are H. Clifford, Rutland-terrace, Hammersmith; S. A. Cobbett, Winchester House, Old Broad-street; V. Holt, St. Anne's Villas; E. J. Houghchurch, Westminster Chambers; E. F. Tremayne, Great George-street; A. Wahab, Rochester-road; and C. F. Stin, St. Michael's House, Cornhill.

TONGE VALE SPINNING COMPANY (Limited).—Capital 70,000*l.*, in 5*l.* shares. To carry on cotton spinning operations. The subscribers, who take 20 shares each, are Albert Dickens, Middleton; H. Heywood, Middleton; E. Whitehead, Middleton; R. Taylor, Chadderton; C. H. Cheetham, Middleton; J. Sumkiman, Oldham; and J. Whitehead, Oldham.

COLONIAL, EUROPEAN, AND AMERICAN TELEGRAM COMPANY (Limited).—Capital 6000*l.*, in 6*l.* shares. To form telegraphic agencies in the various towns of England and America for the purpose of collecting and receiving commercial and other telegrams.

PILSWORTH BLEACH AND DYE WORKS COMPANY (Limited).—Capital 40,000*l.*, in 10*l.* shares. To purchase the business of Messrs. Beetsy and Brown, of Pilsworth, Lancashire, dyers.

CYCLOPS IRON COMPANY (Limited).—Capital 30,000*l.*, in 10*l.* shares. To purchase from Messrs. Carmont, Henway, and Metcalf a plot of land, comprising about 39,166 square yards, situate at Openshaw, according to an agreement made between those gentleman and Mr. E. Rees, on behalf of the company. The business of mining and smelting will be carried on. The subscribers (who take one share each) are—W. E. Kenway, Park-avenue, Gorton, agent for a company; D. Rees, Gorton, engineer; F. R. Gledhill, 20, Livesley-street, Manchester; C. E. Chadwick, Market-street, Blackpool, auctioneer; T. Metcalf, Manchester, manufacturing chemist; H. E. Quant, Church-street, Manchester, manager of chemical works; W. Rammee, Maudsley-street, Bolton, solicitor. The qualification for director is 200 shares. The company's offices will be at 1, Cross-street, Manchester.

BAHIA CENTRAL RAILWAY COMPANY (Limited).—Capital 1,462,500*l.*, in 20*l.* shares. To construct, maintain, and work a railway in the empire of Brazil, from the city of Cachoeira to the Chapada Diamantina, with a branch to the city of the Feira di Santa Anna, in the province of Bahia. The subscribers (who take one share each) are—H. R. Baines, 57, Tulse Hill; F. Dalman, Oriental Club; Lieut.-Colonel Dowson, 99, Cannon-street; F. Youle, 157, Gracechurch-street; J. B. Davison, Datchett; A. P. Youle, Bahia House, Clapton; W. Southall, 2, St. Stephen's-crescent, Bayswater.

INDO-AUSTRALASIAN TELEGRAPH COMPANY (Limited).—Capital 2,000,000*l.* in 10*l.* shares. To establish telegraph communication between India and Australia, and New Zealand and intermediate points in connection with the lines of the Indo-European Telegraph Company (Limited). The subscribers are—W. H. Barton, director of the Indo-European Telegraph Company (Limited), Old Palace-yard, 10; F. J. Goldsmid, Southwell-gardens, South Kensington, 10; H. Weaver, 26, Old Broad-street, 10; W. Andrew, 16, Telegraph-street, 10; C. W. Siemens, 12, Queen Anne's Gate, W., 10; Carl Siemens, Palace House, Kensington, 10; and J. C. L. Loeger, Cedar-road, Clapham Common, 10.

HURST MILLS COMPANY (Limited).—Capital 200,000*l.*, in 5*l.* shares. To acquire cotton mills, &c., at Ashton-under-Lyne, under the will of John Whittaker, deceased. The subscribers are—A. B. Rowley, Hurst, 200; G. H. Henworthy, Ashton, 200; W. T. Rowley, Hurst, 200; W. Thorp, Hurst, 200; J. Pleasant, Hurst, 10; R. Wallwork, Hurst, 200; and J. Wallwork, Hurst, 200.

CHURCH PAPER COMPANY (Limited).—Capital 30,000*l.*, in 5*l.* shares. To carry on business as paper manufacturers.

LITTLE HARWOOD BREWERY COMPANY (Limited).—Capital 30,000*l.*, in 5*l.* shares. To acquire a brewery in Lancashire. The subscribers are—D. Whernill, East Darwen, 50; E. C. Nutall, Blackburn, 30; J. Rawlinson, Lower Darwen, 50; J. Hacking, Darwen, 50; J. Aspden, Over Darwen, and J. Schofield, Blackburn, 5.

STOWER'S BRITISH WINE COMPANY (Limited).—Capital 50,000*l.*, in 5*l.* shares. To acquire the business of Messrs. Jacob and Herbert S. Stower, of London and Liverpool, British wine manufacturers. The subscribers (who take one share each) are—J. Stower, Grosvenor Villas, Brixton Rise; H. S. Stower, Liverpool; G. Conen, 18, Upper-street, N.; F. J. Pottlethwaite, Westbourne Grove, 100; F. Todd, 22, White Lion-street, Islington; G. F. Farrington, Treherne-road; and J. H. Cocker, Mostyn-road, Brixton.

GLADSTONE SPINNING COMPANY (Limited).—Capital 125,000*l.*, in 5*l.* shares. To acquire the Fils Mill, near Oldham. The subscribers (who take 200 shares each) are—J. Taylor, Royton; W. Hilton, Oldham; T. Greenhalgh, Oldham; T. Wallace, Oldham; J. Taylor, Oldham; J. Bottomley, Oldham; J. Lee, Oldham, and W. Halstead, Reishan, Oldham.

VACUUM BRAKE COMPANY (Limited).—Capital 150,000*l.*, in 5*l.* shares. To acquire and work an invention for improvements in railway brakes and the apparatus used. The subscribers (who take one share each) are—D. M. Yeomans, 71, Cornhill; Gilead A. Smith, 23, Change-alley; J. D. Phillips, 23, Change-alley; Antonio Brady, 110, Cannon-street; H. S. Ellis, Exeter; J. Welton, 23, Change-alley.

LEVANT ADVANCE AND TRADING COMPANY (Limited).—Capital 100,000*l.*, in 100*l.* shares. To make advances on all kinds of merchandise, and to act as commission agents, &c. The subscribers (who take one share each) are—Richard Barker, Smyrna; C. Mertens, Walbrook House; M. Wilkins, 44, Finsbury-circus; W. Barker, 26, Nicholas-lane; R. J. Barker, St. Clement's House; E. Barker, 31, Threadneedle-street; and Alfred Conder, St. Clement's House.

W. SINGLETON BIRCH AND SONS (Limited).—Capital 50,000*l.*, in 50*l.* shares. To acquire the business of W. S. Birch, of Upton-street, Manchester, and Sheffield, mineral merchant, and dealer in china-clay, &c. The subscribers are—W. S. Birch, Clairville, near Manchester, 100; T. H. Birch, Clairville, 100; J. Pemberton, 21, Dean-road, Fairfield, Liverpool, 5; E. E. Braithwaite, Clairville, 1; R. Wilkinson, 132, Lloyd-street, Greenheys, 3; T. W. Pemberton, Fairfield, 1.

KIRK RAMSDEN AND COMPANY (Limited).—Capital 50,000*l.*, in 10*l.* shares. To acquire the Turnbridge Ironworks, Huddersfield, and to carry on business as engineers, millwrights, &c. The subscribers (who take one share each) are—Robert Kirk, Huddersfield; C. Ramsden, Huddersfield; F. W. Turner, Holmfirth; F. Preston, Huddersfield; R. Armitage, Scarborough; E. Berry, Huddersfield; H. Berry, Huddersfield; R. Dempster, Elland; B. Grahame, Huddersfield; and E. J. Pelling, Huddersfield.

ALBION REVERSIONARY INTEREST AND INVESTMENT COMPANY (Limited).—Capital 250,000*l.*, in 20*l.* shares. This company is a Bristol company, the object being the advancing of money on various classes of securities, &c. The subscribers are—J. Shute, Clifton Down, Bristol, 25; C. J. Thomas, Dudham Park, Redland, 3; J. Laing, Bristol, 3; R. C. King, Whitchurch, near Bristol, 10; W. Pules, Albion Chambers, Bristol, 3; W. H. Budgett, King-street, Bristol, 2; E. de Salma, Westfield Park, Redlands.

FREEHOLD VILLAS TRUST (Limited).—Capital 100,000*l.*, in 10*l.* shares. To purchase or sell freehold, leasehold, or copyhold property. The subscribers are—D. W. Lambe, 32, Walbrook, 1; G. A. Boyce, 36, St. Paul's-road, Camden-square, 10; W. G. Harrowen, 13, Ladbroke Gardens, W., 5; J. Edwards, 1, Adelaide-place, London-bridge, 1; E. Clark, 19, Buckingham-street, Strand, 5; J. Oliver, Cold Harbour-lane, 10; and R. S. Vivian, 1, Adelaide-place, London-bridge, 10.

THERMOSTATIC COOKER AND HEAT-RETENTION COMPANY (Limited).—Capital 50,000*l.*, in 10*l.* shares. To carry on the manufacture of ovens and roasters and improved apparatus for cooking. The subscribers (who take one share each) are—E. Hart, 57, Moorgate-street; W. Lawley, 78, Farringdon-street; T. Rudkins, 12, Metropolitan Meat Market; J. W. Salisbury, 6, Metropolitan Meat Market; J. C. Peacock, 14, Queen's-square, W.C.; J. A. E. Wilson, North Cray-road, Bexley; and G. W. Ruck, 13, Liverpool-road.

W. AND J. GARFORTH (Limited).—Capital 60,000*l.*, in 10*l.* shares. To acquire the business of the late William Garforth and James Garforth, of Dukinfield, engineers and ironfounders. The subscribers are—A. Hamilton, King's-street, Manchester, 50; W. E. Garforth, Dukinfield, 50; W. J. Fallone, Dukinfield, 20; H. Hall, Boothdale, Ashton, 50; P. Rothwell, Denton, 50; and T. H. Rudkin, 1, York-street, Manchester, 50.

NEW MANUFACTURE OF PLATES, SLABS, OR TILES.—Mr. GEORGE has patented (for Messrs. Guelton and Co., of Rue Lafayette, Paris) a new or improved manufacture of plates, slabs, or tiles, in imitation of the ware known as "Faience Parisienne." The plates, slabs, or tiles, the subject of this invention, are produced from cements. The cement is spread in a semi-liquid state upon tables of plate glass; the glass is then beaten with a wooden mallet to render the layer of cement perfectly uniform. To rapidly harden this semi-liquid cement there is springled over its surface powdered cement, which in a few minutes absorbs the water which has served to mix the first cement; this surface is then levelled and smoothed by pressing firmly upon it with a trowel, or other suitable instrument, which completes the hardening of the layer. This work completed the product is rendered less brittle by spreading over this layer a piece of canvas, upon which is placed another layer of liquid cement, two straight edges being first placed on each side to obtain the desired thickness either of the tiles or of the slabs or plates. Twenty-four hours after this first operation the plates are removed, and divided into slabs or tiles, according to requirement; they are then put into a stove; upon the part which has adhered to the glass there is then spread a coating of varnish, in order to imitate enamel. The products are then again placed in a stove, where they remain for 24 hours. When it is desired to decorate the plates, tiles, or slabs, after leaving the stove they are pumice-stoned, decorated, a fresh coating of varnish applied; they are again placed in the stove, and 24 hours afterwards they may be withdrawn for use. To produce plates, slabs, or tiles coloured, but without pattern, the desired colour in powder is added to the varnish.

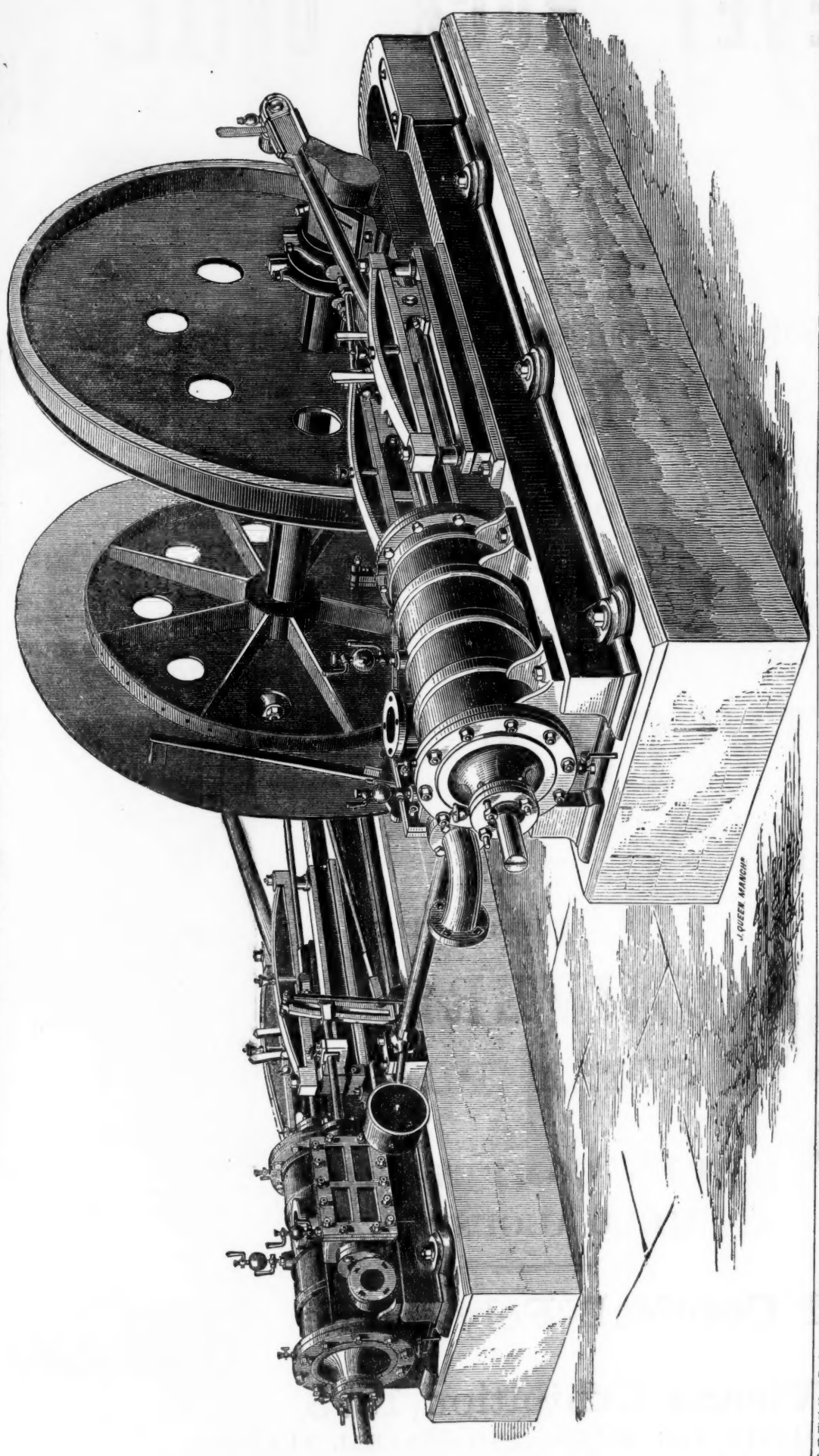
SMELTING IRON.—Mr. W. A. LITTLE, of the Grove, Hammersmith, engineer, has patented some improvements in the smelting of iron. The features of novelty are—1. The consolidation of crushed or powered iron ore with any crushed or powered mineral required for fluxing by means of hydraulic lime or hydraulic cement, with or without the intermixture therewith of common lime.—2. The incorporation of a mixture of crushed or powered iron ore, lime, and clay, with the lime and clay in such relative proportions as are used in making Portland cement, and the calcination of this conglomerate. This calcined mixture will possess the properties of cement, and can be consolidated into concrete by means of water, with or without the admixture of powdered fuel.—3. The incorporation and calcination of a mixture of soft or powdered iron ore and clay, preparatory to its consolidation as a concrete by means of hydraulic lime or cement, as above stated.—4. The consolidation in lumps for smelting, which is also the object of all the foregoing mixtures, of crushed or powdered iron ore, lime, and fluxing silicates if required, by means of plastic clay incorporated therewith. All these consolidated mixtures are intended to be smelted by fuel in a blast-furnace in any desired way, each lump of conglomerate containing in itself all the ore and fluxing ingredients in an intermixed state.

TREATMENT OF METALS.—Mr. G. J. SNELUS, manager of iron and steel works, Workington, has patented some improvements in the treatment of solutions containing metals, and soda and other salts for effecting the separation of the same. The patentee says—"According to my invention, I separate from the aforesaid solutions the precious metals with a fractional part of the copper before proceeding to the complete precipitation of the latter metal, and separate the sulphate of soda in marketable purity after the precipitation of the copper. The separation of the silver and gold is effected by iron in a fine state of division. For the gradual addition of iron to the solutions, and their simultaneous agitation, I employ a blast of air which carries with it the powdered iron. After allowing the precipitated metals to subside the solution is run off, and the copper completely precipitated. By continuing to evaporate and to add fresh quantities of solution, a large proportion of the sulphate of soda may be separated."

STEAM GOVERNORS.—The invention specified by Mr. CHASE, of Boston, U.S., describes his improvements in steam governors, the object of which is to produce a centrifugal governor of greater sensitiveness than those of the ordinary construction. This he effects by dispensing with steam-packed valve-stems, jointed arms, &c., and thus avoids the friction consequent on the use thereof; and his invention consists—1. In constructing a steam governor with a steam chamber provided with induction and eduction ports, and locating in such chamber a rotary steam conductor or conductors, provided with valve ports and having valves which shall close such ports by the direct action of their centrifugal force.—2. In constructing a steam governor with a steam chamber provided with induction and eduction ports, and locating in such chamber a steam conductor provided with valve ports and having a valve which shall close such ports by the centrifugal action of balls or weights acting upon a spring affixed to the driving shaft and having its ends connected with the valve on opposite sides thereof. The essential parts of the governor are a hollow steam chamber having a removable cover or part, and the enclosed centrifugal mechanism; the arrangement of such centrifugal mechanism within the said steam chamber constituting the main feature of the invention.

BRICK-MAKING MACHINERY.—The invention of Mr. C. W. THAIRLWALL, of Leeds, relates to brick-making machines, which have a horizontal pug-mill and revolving mould wheel. The pug-mil shaft is furnished with knives, and carries a worm on its end to force the clay into the moulds in the said mould wheel. Underneath the mould wheel and perpendicular to the axis of the pug-mill is a hollow plunger. The movement of the mould wheel is intermittant, and is produced by a rocking bar and pull catch. The said mold wheel makes a quarter revolution at each movement, and is held during the pressing of each brick by a spring catch or trigger. A large wheel loose on the said pug mill shaft transmits its power through a brake strap and wheel.——The invention of Mr. P. BAWDEN, of Norland square, relates to a machine for making bricks either by "pallet moulding" or by "slop moulding," that is to say, either by sanding the mould or by dipping it in water. The machine is particulary adapted for making fire-bricks, and it will also make the best facing bricks in a sanded mould without the sand-flaws which occur in hand-moulded bricks.

STORING EXPLOSIVE MATERIALS.—Messrs. A. MACKLIN, of Tollington Park, and W. A. MOORE, of Brixton, have patented certain improvements in the stowage for transport, and in the storing of gunpowder and other explosive materials, and improved apparatus in connection therewith. These improvements are based upon the introduction of the barrels or boxes of powder into hermetically closed boxes, covered with felt or other material which will absorb and retain moisture for a considerable time, such boxes being used in combination with tanks in which their total immersion is secured when in transit by road, rail, canal, or otherwise, as well as when stored in a magazine, warehouse, or elsewhere.



PAIR OF HORIZONTAL HIGH-PRESSURE WINDING ENGINES.
CONSTRUCTED BY MESSRS. POLLOCK AND MACNAB, BRITANNIA IRONWORKS, HYDE, NEAR MANCHESTER.

PAIR OF HORIZONTAL HIGH-PRESSURE WINDING-ENGINES.

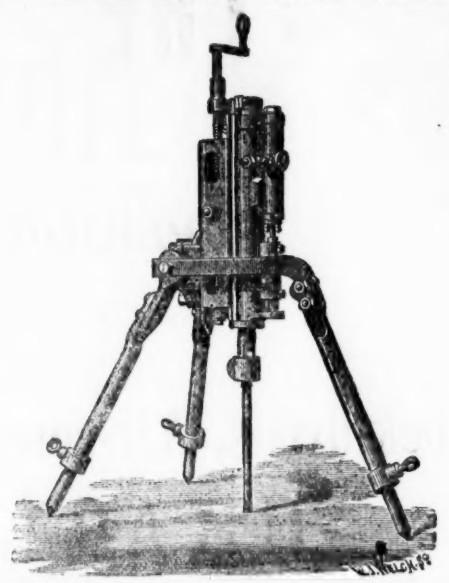
By Messrs. Pollock and Macnab,
Britannia Ironworks, Hyde, near Manchester.

Attention is at present being directed to the class of horizontal high-pressure winding-engines turned out by the firm of Messrs. Pollock and Macnab, of Hyde, near Manchester, and as they have met with a favourable reception amongst the mining public, a pair of them is here illustrated.

There is a growing tendency amongst mining engineers toward economy of material, and as a result winding-engines have been placed on the market of such exaggerated lightness of construction that some have suggested they were never seriously intended for the varying straining work to which winding-engines in general are submitted. Unquestionably much may be wisely done in taking out material where it is not required, for reasons that judicious mechanical arrangement may be made to throw all heavy strains off such parts, but many much question the advisability of running a light frame round a winding-engine, the weakness of which must be compensated by attaching it to a very solid stone foundation. The general design of Messrs. Pollock and Macnab's winding-engine shows, however, that they at least have not fallen into this error, for the bed-plates are strong and massive of the box-girder section, with a semi-circular front. The cylinders which are carried by these bed-plates are 16 in. inside diameter, with a stroke of 3 ft., and fitted with pistons made on the coil-spring principle, and with piston-rods extending through the back cylinder covers, the latter being made of best crucible steel 3 in. in diameter. The slide-bars are made to rest with their whole surface on the bed-plate, due attention being paid to the easy oiling of the slides, and for collecting the grit at either end. Extra length and bearing surface has been given to the slide-blocks, to which reasons the makers partly attribute the perfect steadiness and noiselessness of these engines. The connecting-rods and cross-heads are in due proportion to the other massive proportions of this construction, and the cross-head ends of these rods are forked with double bearings, and the usual means afforded for tightening up the brasses according to tear and wear. The lubricators used are Leuvain's patent. The drum-shaft is 9 in. diameter with 7-in. necks of wrought-iron, and has a keyway sunk the whole length of its surface, in order to fix at pleasure the drum-sides at any distance asunder. The latter are made in halves, likewise of heavy construction. The pedestals carrying the drum-shaft are inclined, so as to throw the central thrust on to the solid part. The cranks are set at right angles to each other, being fitted with Bessemer steel crank-pins. Turning to the controlling part of these engines, they are provided with the curved slot-link reversing motion, working with double eccentrics and single slide-valve. The valve-spindles are carried by a bracket between the ends of the slide-bars, forming one of the pillars for the same, the valve-chests being cast with the cylinders. For quick starting and stopping a wedge stop-valve is used, and the cross-shaft connecting the two link motions is arranged underneath the floor-line, so as not to be in the way of the engineer, within whose easy reach and control the foot-lever for brake and the stop-valve handle are brought. The brake-strap is arranged to one drum-side, for which purpose the latter has a double-flanged seat cast on, and subsequently turned, to ensure a perfect surface for the brake-strap.

As to the finish of these engines, the cylinder covers are turned and polished all over; the valve chest covers being neatly panelled, with each joint faced all the way across, whereas the links of best wrought-iron forgings are finished bright. The engines, taken as a whole, present a neat design, and one of the best combinations extant for durability and steadiness of working, offering at the same time simplicity of arrangement.

THE "CHAMPION" ROCK BORER.



An improved Rock Drill, the invention of Messrs. Ullathorne and Co., of Queen Victoria-street, can now be seen at work in London, and from the manner in which the No. 2 size, with 45 lbs. pressure of steam, goes through tough Guernsey granite at the rate of 4 inches per minute, it is considered well entitled to its designation of the "Champion" Rock Borer; indeed, the proprietors do not hesitate to say that it surpasses other rock drills in their good qualities and avoids their imperfections, while being of the very best make and material it is absolutely the cheapest in the market. It is claimed that the new machine works with wonderful steadiness, and can be driven at very great speed if required with perfect safety. The rate of progress varies from 3 in. to 15 in per minute, according to the diameter of the hole, the nature of the rock, the size of the machine, and the pressure of the motive fluid. It will bore perfectly round holes in any direction, and the drill clears itself as it progresses. The piston-rod carrying the steel drill is caused to partially rotate on each backward stroke, and is allowed to travel without turning on the forward stroke by an arrangement which is simple, and has advantages over all others. This arrangement causes regularity of rotation, but in case of the boring tool accidentally jamming in a hole, and being absolutely prevented from turning by any chip or other obstruction it gives way, and thus avoids all chance of the breakage which occasionally occurs in other rock drills. It has a very simple hand feed, whereby it is wound forward as the drill penetrates the rock. The machine may be wound considerably out of stroke, but should it stop through overwinding it may be instantly started again by moving a connection with one of the valves. With some other rock-drills, when they are stopped through overwinding, there is considerable inconvenience and delay, as it is necessary to cut off steam, wind back, and push out the piston-rod before they will start again.

When desired an automatic feed is supplied with the borer at a slightly additional cost, and it is remarked that the advantages of this in tunnel and other work cannot be over estimated, is not dependent on the attention of the operator, it is simple and self-adjusting, varying with the hardness of the rock, and the degree of sharpness of the drill point, the machine is thus fed forward in proportion as the steel drill penetrates the rock, ensuring steady and rapid boring, and preventing the frequent stoppages through overwinding which take place in other rock-drills fed by hand. It is true some other rock-drills are provided by an automatic feed, but it is either too complicated for practical use, or the feed takes place on the forward stroke at the moment the steel drill strikes the rock, thus causing great strain, or the machine is fed forward at a uniform rate, which is obviously unsuitable; the automatic feed in this case takes place on the backward stroke, and is open to none of these objections. The Champion can be adapted to almost any description of stand or carriage. The universal clamp attached to it, and by which it is mounted, is so arranged in two pieces that the machine can be readily fixed on its tripod or other stand, or to any part of a bar of suitable diameter, and as readily removed. When mounted it may be pointed in any direction, and requires the tightening of only one bolt to secure it in position.

The steel drills which fit into the end of the piston-rod are simply made of the best plain bar steel, turned at one end to fit into the piston-rod, and formed with a cutting edge at the other. The cutting edge may be Z, X, or chisel shaped, according to the nature of the rock, and should be well hardened; it is not essential, as in hand-boring, that it should be sharp, the force of the blow alone disintegrating the rock. For commencing holes or in jointy rock, and for general use, an X shaped point has been found the best, though in soft rock a Z point, and in hard rock a chisel shaped point, usually ensures greater rapidity of penetration. The Champion may be driven by either steam direct from a boiler, or by compressed air. In all open air workings, steam direct may be used as the motive power; the boiler, however, should be as near the rock-borer as possible, in order to avoid condensation of the steam and loss of power. In some cases it is advisable to have the boiler mounted on wheels, in order that it may be moved about, and kept near to where the rock-borer has to be worked. Even in shafts or underground workings at a short distance from the open air, steam may be used, though in all cases it is preferable to use compressed air, for when steam is used it condenses, and there is the annoyance of water in the cylinder every time the machine is started, whereas with compressed air this annoyance, and that of the exhaust steam blowing out, are avoided, and in consequence of the machine being perfectly cool it is easily handled by the operator. Where air can be compressed by water power, compressed air may be advantageously and economically used in quarrying and open work. In tunnels, shafts, mines, and underground work generally compressed air should be used as the motive power, and it serves the additional purpose after doing its work in the machines, of furnishing an abundant supply of fresh air and consequent ventilation, besides being of service in clearing away the smoke after blasting. The air is compressed by an air-compressor driven by either steam or water power, and placed in the most convenient situation; the air may be conveyed in iron pipes to any distance without appreciable loss of power. As compared with hand-labour the saving in time, labour, and expense is very great. It is estimated that by the use of the "Champion" rock-borer work can be progressed at more than double the rate and at less than half the cost; the general expenses, interest on capital, amount of maintenance of staff, &c., are thus immensely reduced. The saving in steel drills and smiths' work is almost incredible, the cost in this item alone being reduced to one-tenth.

Rolling Iron and Steel.—Mr. W. Brown, of Smethwick, iron-master has patented some improvements in machinery for rolling rails, girders, bars, and plates or sheets of iron and steel and other metals. According to this invention two pairs of rolls are arranged end to end, or in the same or nearly the same line, one pair of rolls having the motions necessary for carrying the bloom or bar through them in the opposite direction, or for giving it a return motion. The inner ends of the bottom rolls are supported by a short housing, a gap or opening being left between the inner ends of the two pairs of rolls, so that the bar or bloom by a lateral motion may be transferred from one pair to the other pair. The removal and replacement of the rolls is also facilitated. The two pairs of rolls are so geared together that one pair is made to drive the other pair, the two pairs of rolls having the required motions communicated to them. The whole of the grooves in the rolls are working grooves, hence the rolls need only be about half the length of those ordinarily used. A sett of three high rolls and a pair of rolls may be arranged and driven as described with respect to two pairs of rolls.

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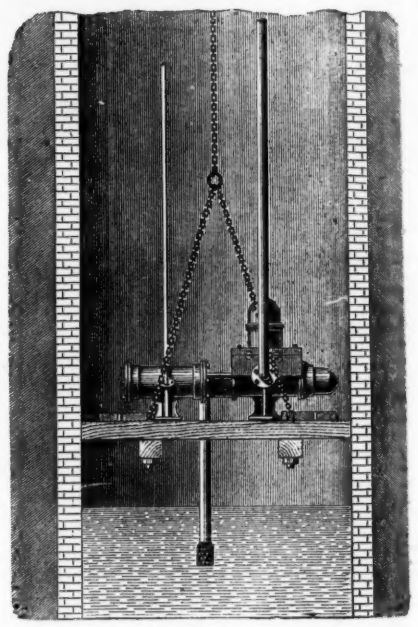
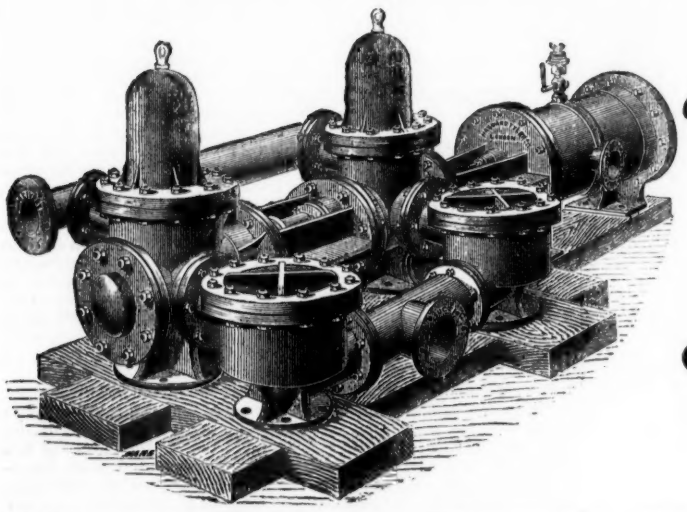


FOR THEIR PATENT



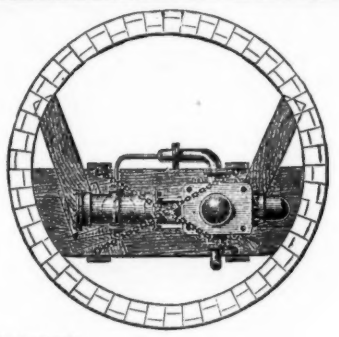
"UNIVERSAL"

STEAM PUMP,

IN AN

OPEN COMPETITION,

HELD AUGUST, 1874.



Silver Medal: Royal Cornwall Polytechnic Society, 1872.

Medal for Progress: Vienna Exhibition, 1873.

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References to places where it is at work will be given on application to the makers,—

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ENGINEERS, BELFAST.

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